THE MAGAZINE OF

Standards

Industry's standard for laboratory glassware figures in Government-Industry Cooperation on Standards **(page 172)**

June 1956

THE MAGAZINE OF

Standards

June, 1956 Volume 27, No. 6

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Published monthly by the
American Standards Association, Incorporated
70 East Forty-fifth Street, New York 17, N. Y.

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Single copy 60¢. $7.00 per year (foreign $8.00). Schools and libraries $5.00 (foreign $6.00). This publication is indexed in the Engineering Index and the Industrial Arts Index. Re-entered as second class matter Jan. 25, 1954, at the Post Office, New York, N. Y., under the Act of March 3, 1879.
Opinions expressed by authors in THE MAGAZINE OF STANDARDS *are not necessarily those of the American Standards Association.*

Marginal Notes

"The Most Important Standards"—

Nationally coordinated standards for safe use of nuclear energy by industry must be started now, the Standards Council of the American Standards Association decided at its meeting June 1. Basis for the Council's action was a report presented by Morehead Patterson, who is Chairman of the Board and President of the American Machine and Foundry Company, New York, and also chairman of the Planning Committee on Standardization in the Field of Nuclear Energy. This committee was set up at a general industry conference last December to advise ASA on whether American Standards are needed.

A letter ballot vote is being taken to confirm this action by the Council.

Hot Off the Press—

Seventy-nine cases in which companies have experienced savings through the use of standards are described in a new edition of the very popular *Dollar Savings Through Standards*, just published. Many of the cases in the 1956 edition are entirely new, and most of the others have substantial revisions and additions. Copies of the 40-page book, in heavy paper cover, are available without charge from the American Standards Association.

Also just off the press is a 20-page booklet, *How American Standards Are Made*. This tells simply and clearly what the American Standards Association is, how it operates, and how American Standards are developed. No charge.

The Next Issue—

Two important meetings—the Company Member Conference and the Standards Council of ASA—will be reported in the next issue. A paper presented at the CMC meeting on how IBM has developed a Coded Parts List and a Standard Parts Program Evaluation Report will be an important feature.

Important Meetings— A Reminder—

October is to be the meeting month for Standards Engineers.

You will want to plan now to attend the Seventh National Conference on Standards at the Hotel Roosevelt, New York, October 22, 23, and 24. Standards for atomic energy will be one of the important subjects discussed, in addition to sessions on fire protection, on the chemical industry, and sessions sponsored by the Company Member Conference, the Conference of Executives of Organization Members of ASA, and the Standards Engineers Society.

Earlier in October the Standards Engineers Society is holding its Fifth Annual Meeting at Washington, D. C. Place is the Hotel Willard. Time, October 3, 4, and 5. Theme of the meeting is Standards —Guides for Tomorrow.

SES reports that a number of companies are using its requirements for membership as a guide to qualifications for prospective "Standards Engineers."

The Front Cover—

Fairchild Engine & Airplane Corp

Standards for laboratory glassware developed by committees of the American Society for Testing Materials have been accepted as standards for use by the General Services Administration, says Willis MacLeod in his report on Government-Industry cooperation (page 172). Mr MacLeod lists a growing number of fields in which standards developed by industry committees are being accepted by government.

In this picture, a chemist is filtering precipitates, using the filtering process to determine the sulphate content of chromium plating on some parts of aircraft engines.

This Month's Standards Personality

WILLIAM H. OFFENHAUSER, JR, known as "the man who wrote the book," has devoted much of his energies over the past 25 years to improving motion picture and sound performance and encouraging the adoption of high performance standards through the member technical societies of the American Standards Association. He started his work with the Society of Motion Picture Engineers, taking an active part in the dimensional standardization of 16mm sound films. For this he was given the Fellow Award of the Society in 1946.

Soon after Pearl Harbor he commuted between New York and Washington, spending most of the week at Johns Hopkins University in Section T of the Office of Scientific Research and Development under the U.S. Navy Bureau of Ordnance. He was indoctrinated by Dr L. R. Hafstad. At first Admiral Blandy was Chief of the Bureau; later Admiral Hussey, now Managing Director of the American Standards Association, assumed command at the Bureau. The work of this group with the proximity fuze, fire control, and jet-powered missiles is now recognized as an outstanding contribution to the science and engineering of military weapons. For his part of the work, he was awarded an OSRD Certificate on March 1, 1945.

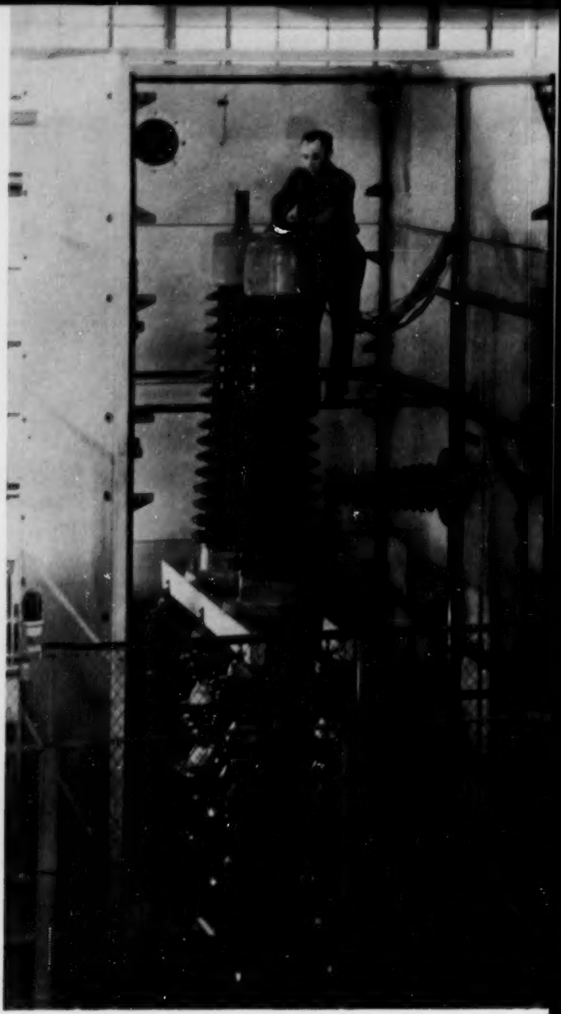
With that mission completed, he continued his standards work in the task groups of the Z52 War Committee on Photography and Cinematography that produced such outstanding specifications as the Military Model Projector and films designed to test it. He wrote the first draft of the picture and sound synchronization mark standard, which was adopted substantially as he drafted it. He was awarded an American War Standards Certificate by ASA for his contributions to this program.

While a Consultant for the Signal Corps Photo Center, he became chairman of the Photographic Subcommittee of the NDRC Tropic Deterioration Project. For this he was awarded a National Defense Research Committee Certificate.

Then came his interest in the sounds of mosquitoes. He has the distinction of being the first to make high-quality recordings of their sounds suitable for both wave analysis and for response tests. In so doing he has vindicated the ideas of Hiram Maxim who had been told over 50 years ago that such notions were "too stupid to publish." Belatedly, such sounds are now recognized as being as important scientifically as were the Maxim Silencer and the Maxim Gun of 50 years ago.

Next, "the book." It is *16Mm Sound Motion Pictures,* a manual of over 500 pages first published in 1949 and reprinted in 1953, a labor of six years of writing and twenty years of fact collection. Standardization finds its rightful place among its pages as it does in *Microrecording,* a text he has just completed with Chester M. Lewis, formerly vice-chairman of ASA Sectional Committee Ph5, Photographic Reproduction of Documents. Both books were published by Interscience, New York. He tells us that there is more to come; "If it is worth having, it must be standardized if we are to make better things for better living for more people."

Photo Courtesy Julius Postal, Audio Engineering Society



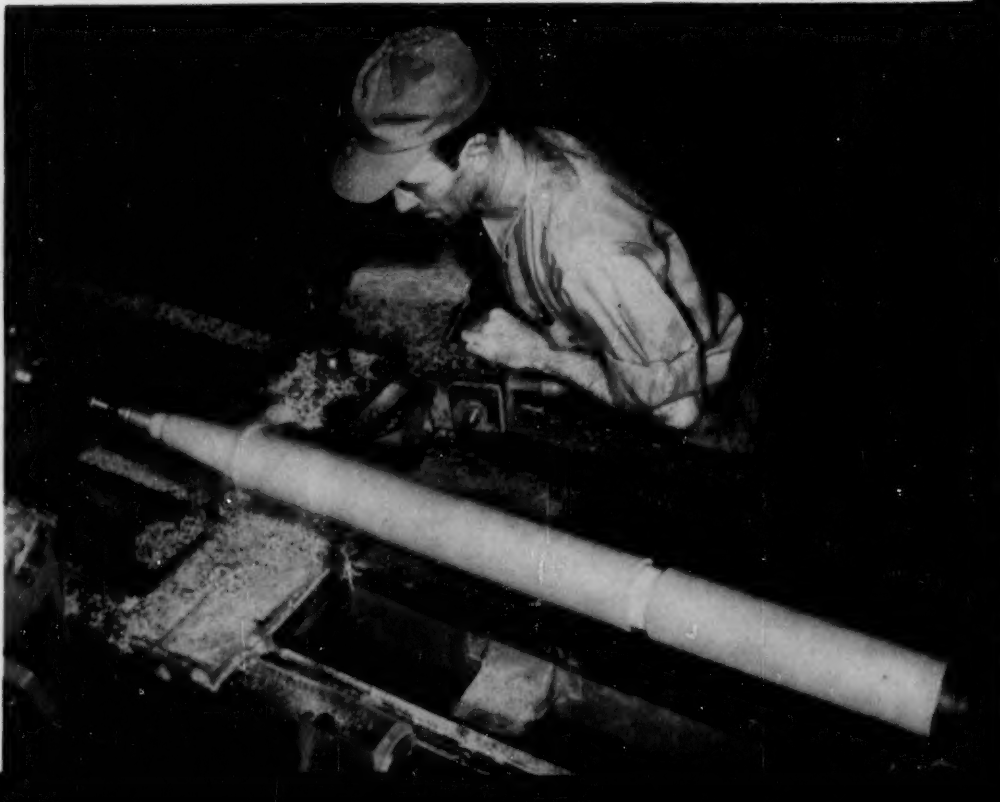
Photos Courtesy Ohio Brass Co.

A series of operations during manufacture of bushings

RIGHT—*precision machining gives final size and shape to condenser core*

ABOVE, LEFT—*assembling an apparatus bushing—parts are held in assembled condition by compressive force of a series of springs*

ABOVE, RIGHT—*pair of bushings for 230-kv service is given simultaneous high-current and high-temperature test.*



DIMENSIONS, INTERCHANGEABILITY IMPORTANT

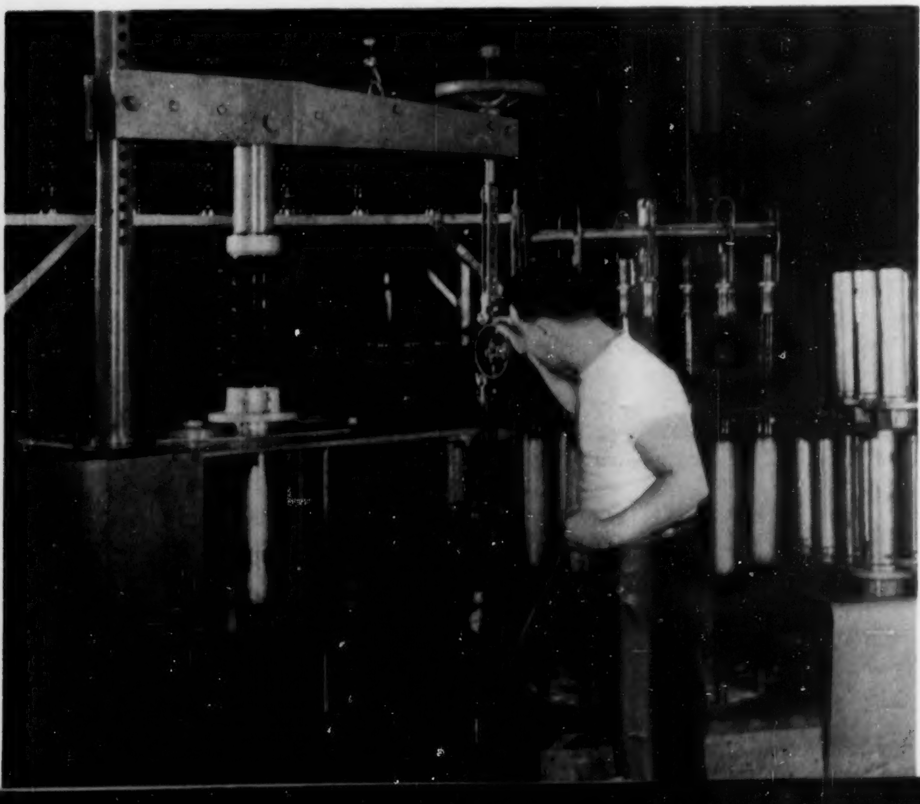
as work on Bushings continues

committee asks users comments

"STANDARDIZATION of bushings for electrical apparatus offers economic advantages to both users and manufacturers," declare G. W. Clothier and J. R. North in a report on work being done by Sectional Committee C76, Apparatus Bushings Standardization. The committee was organized early in 1955. Mr North, Chief Electrical Engineer, Commonwealth Associates, Inc, Jackson, Michigan, is chairman; Mr Clothier, Manager of the Transformer Department, Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, is secretary.

At the present time, as they point out in their report, an American Standard approved by ASA in 1943, Apparatus Bushings and Test Code for Apparatus Bushings, C76.1-1943, is still in effect. This standard was prepared by a joint committee of the Electrical Machinery, Power Transmission, and Distribution Committee and the Protective Devices Committee of the American Institute of Electrical Engineers. It was approved as AIEE standard 21-1942 before its approval by ASA as American Standard.

Modifications have been completed for inclusion in a second American Standard on bushings titled Electrical and Mechanical Characteristics of Apparatus Bushings (Used with Power Circuit Breakers and Outdoor Transformers), C37.4a-1954 and C57.12b-1954. This standard, originally prepared by a subcommittee of the Electrical Standards Board, was given official approval by both ASA Sectional Committee C37, Power Circuit Breakers, and Sectional Committee C57, Transformers. Committee C76 was organized as a full-fledged sectional committee on recommendation of the ESB subcommittee following completion of this standard.



POWERFUL SPRINGS *within oil reservoir impose live, follow-up load on all gasket joints of bushings. Spring compression is set and measured at time of assembly.*

Committee C76 has held two meetings, one in June 1955 and the other in March 1956. The scope of its work is defined as: "Standards and test codes for all apparatus bushings and including roof, floor, and wall bushings, but not potheads for cable terminals, nor insulators for back-connected disconnecting switches, nor bushings for communication equipment."

The committee has a well-balanced membership with representatives from the American Institute of Electrical Engineers, the Electric Light and Power Group, the National Electrical Manufacturers Association, the Tennessee Valley Authority, U. S. Department of the Interior, the Bureau of Reclamation, and liaison representatives from Sectional Committees C37 and C57.

A great deal of work must be done on many phases of bushing standardization, the committee officers report, but the committee believes that it is most important now to work on dimensional standardization of bushings above 69 kv; specifically, the four voltage classes 115, 138, 161, and 196 kv.

Use of these bushings is confined almost exclusively to oil-filled circuit breakers and transformers. The initial objective of the committee was to obtain a standard bushing in each voltage class that would be applicable on either a circuit breaker or transformer of any manufacturer. Since this involved all manufacturers of transformers and breakers, in addition to all manufacturers of bushings, the job was extremely difficult. Every effort was made to compromise all designs so that complete interchangeability could be achieved. Detailed studies were made of the compromises necessary. At one time it appeared that a satisfactory bushing could be designed by all manufacturers. However, it eventually turned out that problems peculiar to each design make it uneconomical or unsound engineering to reach a complete solution at this time.

For example, the lower end terminal for circuit breakers is necessarily quite substantial mechanically, an obvious disadvantage to a transformer design. Alternate designs, based in a limited way on previous experience, have been considered, but all have had new features.

External dimensions present a serious problem to the extent that they are affected by parts of the breaker or transformer.

Another desired requirement was that interchangeability include potential taps, potential devices, and mounting details, not only in dimension, but in electrical output as well. But capacitance values for each bushing are dependent upon each designer's experience and facilities, and cover a considerable spread.

Bushings used on small kva high-voltage transformers may be relatively short to reach from the tank cover to the oil level and similar in length to a circuit breaker bushing which has a relatively small oil volume. But the same voltage class bushing used on a very large kva transformer requires a long shank to reach from the cover to the oil. Therefore, several shank lengths in each voltage class would be necessary to cover the expected oil level requirements in transformers and breakers.

Circuit breakers generally require 1200 ampere or 1600 ampere bushings but transformers seldom need over an 800 ampere bushing and actually not many need over 400 amperes. Therefore, several current ratings of bushings would be necessary. Since draw lead construction permits a more economical transformer and one much more easily serviced in the field with less danger to the transformer, most transformers would employ a draw lead. Thus, the majority of transformers would use 800 ampere and less draw lead bushings and all circuit breakers would use 1200 ampere and higher fixed conductor bushings. There is no interchangeability on the basis of current rating.

The trend toward circuit breaker ratings of higher kva requires increasingly higher mechanical strength, placing an economic penalty on use in transformers of bushings designed for circuit breakers.

Because of the complications in attempting to get interchangeability between circuit breakers and transformer bushings it is likely that the committee's work will proceed on the basis of standardization upon separate bushings.

The committee also gave consideration to the limitation which might be put on further circuit breaker and transformer development if bushing dimensions and designs should be frozen at this point.

In proceeding with its work which it plans now to extend to bushings above 69 kv, the committee has established certain current ratings as desirable for the standard bushings. The BIL (Basic Insulation Level) of the bushings and their voltage ratings have also been fixed.

In all of this work the basic impulse insulation levels are being taken as determined by the AIEE-EEI-NEMA Triple Joint Committee on Insulation Coordination.

Possibilities for a 92 kv bushing are being further explored.

Progress is being made toward standardization of separate bushings by the National Electrical Manufacturers' Association. Both the Circuit Breaker and Transformer Sections have committees actively at work on this phase.

It is believed that NEMA will be able soon to provide Committee C76 with positive proposals.

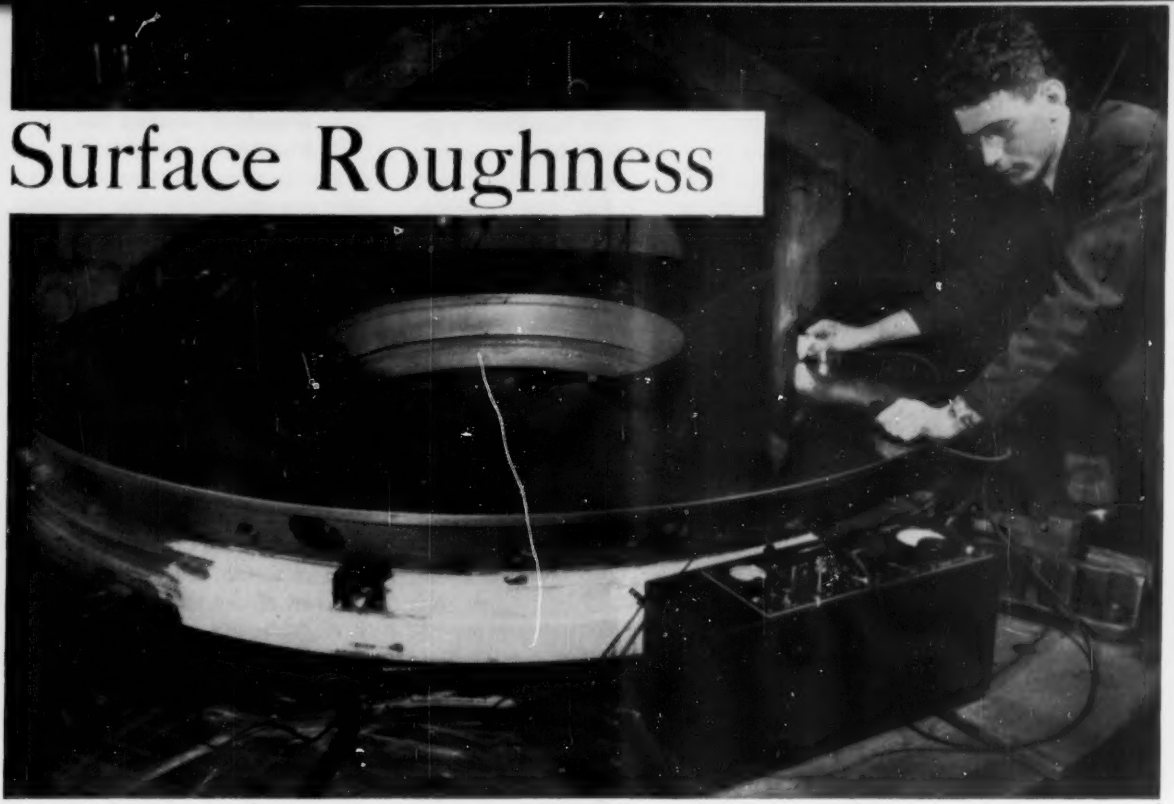
Sectional Committee C76 will welcome information and proposals from user groups as well.

IEC Matters

International standardization work is being carried out by the International Electrotechnical Commission. Sectional Committee C76 has set up a working group under the leadership of E. V. DeBlieux of General Electric Company to study the many IEC proposals on bushings and to make recommendations concerning them.

Sectional Committee C76 was represented at the London meeting of IEC in June 1955 by E. M. Hunter and at a meeting in Paris in November 1955 by G. W. Clothier.

Surface Roughness



Checking surface roughness of 105-in. diameter thrust bearing.

and the Design Engineer

This paper was contributed by the Machine Design Division of the American Society of Mechanical Engineers for presentation at the ASME Diamond Jubilee Spring Meeting, Baltimore, Md, April 18-21, 1955. So much interest has been shown recently in the American Standard on Surface Finish, B46.1-1955, *that the paper is published as information for ASA members.*

by JOSEPH MANUELE
Director, Headquarters Quality Control
Westinghouse Electric Corporation
Pittsburgh

UP to 20 or 25 years ago, it was customary for design engineers to specify the degree of surface roughness required on a machined part by such terms as "finish all over," or "grind smooth." This set the stage for an argument between the inspector and the foreman; the engineer and the inspector; and the foreman and the operator. The term, "grind smooth," was a very flexible one and its interpretation depended upon the judgment of the inspector. The final quality of the surface was the result of who could talk the loudest or the longest—the inspector or the foreman. Even with the same inspector, the standard would vary from day to day as the inspector's judgment was conditioned by factors outside his work which affected his temperament. Instruments were not available for measuring surface roughness and generally the only tool used was the inspector's fingernail or the edge of a penny.

About that time, two things happened. In the first place, professional groups, such as The American Society of Mechanical Engineers, and the Society of Automotive Engineers, became interested in the problem of surface roughness and, through their sponsorship, the American Standards Association set up Committee B46 to study the general subject of surface quality and make recommendations for its evaluation. In the second place, Ernest Abbott perfected the "profilometer," a stylus-type instrument for measuring surface roughness. The profilometer measured surface roughness in root-mean-square microinches deviation from the nominal surface. This value was read directly on a meter, requiring no calculations.

Early Use of Profilometer

In the early days the profilometer was used most extensively for measuring surface roughness for determining changes resulting from im-

provements in the process. It was used more by manufacturing people for improving the process for generating the desirable surface than it was used by design engineers for specifying any desired degree of roughness. It was just another inspection tool and, as such, it was used by the inspector for measuring, as against estimating, the roughness of a surface. In this manner, the inspector was able to tell the real difference between two surfaces, and to all intents and purposes, establish a standard.

Having established a standard acceptable to the inspector, it then became incumbent upon the manufacturing organization to standardize procedures for producing the standardized degree of roughness. It soon became evident that it was cheaper to produce a specific surface roughness by using standard procedures than it was to obtain an unspecified smooth surface when the method was left up to the operator. Hence, in the early days, the request for standardizing surface roughness came from the manufacturing organization which could see its cost reduction possibilities.

However, in some branches of industry there was an engineering urgency for establishing standards of surface roughness in the interest of product performance improvement. This was particularly true in the automotive industry. It was felt that longer life and greater efficiency would result from smoother surfaces. But how smooth a surface should be, no one seemed to be willing to state.

American Standards Association Sets Up Committee

Therefore, the American Standards Association was importuned to establish Committee B46 in 1932 to study the problem. In 1940, the committee submitted a pamphlet describing a method of "designating surface roughness, waviness, and lay." The question of what degree of surface roughness was most desirable for any particular application was left unanswered.

This original pamphlet went through several revisions and in 1947 the American Standards Association finally published an American Standard on Surface Roughness, Waviness, and Lay, still sidetracking the problem of making any recommendations of surface-roughness standards for any specific application.

In this first edition of the American Standard for Surface Roughness, Waviness, and Lay, surface roughness was defined as "relatively finely spaced surface irregularities. On surfaces produced by machine and abrasive operations, the irregularities produced by the cutting action of tool edges and abrasive grains, and by the feed of the machine tool, are roughness. Roughness may be considered as being superimposed on a wavy surface."

The 1947 edition of the standard stated that "the height of the roughness shall be specified in one of the following terms:

"Maximum peak to valley height
"Average peak to valley height
"RMS average deviation from the mean surface
"Arithmetic average deviation from the mean surface."

It is seen that the engineer had his choice of four methods of specifying surface roughness. Naturally, this did not create a standard in the strict sense of the term. This was really four standards. However, since only one instrument was available at that time for measuring surface roughness and, since that instrument measured RMS average deviation from the mean surface, in actual practice, RMS average deviation became the standard method of designating surface roughness. Engineering specifications, hence, were based on RMS values, whether the engineer realized it or not.

It is necessary to mention this lack of a single standard since the British commenced to publish standards on surface roughness at this time and their standards were based on "center line average"; that is, the arithmetic average of deviations from the center line. British instruments for measuring surface roughness are calibrated on this basis.

Standard Method for Measuring Roughness

The British and American concepts of a standard method for measuring surface roughness now have been reconciled. It is agreed, both in America and in England, that surface roughness shall be designated as the arithmetic average of the deviations from the center line. In America, it is called the arithmetic average; in England, it is called the center line average (CLA).

For the benefit of those engineers who have already designated standards for surface roughness expressed in terms of root mean square, RMS, it might be appropriate to mention that the root-mean-square average deviation is approximately 1.1 times the arithmetic average deviation. This relation between RMS average and arithmetic average can best be understood from a study of Figure 1.

This has clarified the standard method of designating surface roughness for the design engineer. Now, he has only one number to express the standard and that number designates the arithmetic average of the peaks and valleys of a surface from the center line. However, this does not solve completely the problem of specifying surface roughness. The engineer still has the problem of frequency response. This corresponds roughly to the distance between irregularities, or the wave length of irregularities. This is a very important characteristic of a surface.

As new instruments for measuring surface roughness were put on the market, it was noticed that different instruments gave different readings on the same surface. Instrument makers explained this phenomenon by saying that different instruments had different frequency responses. In an electrical integrating instrument, frequency-response characteristics permit exclusion of all wave lengths greater than the cutoff value when the surface is traced at a specified speed. Electrical instruments with adjustable frequency response or variable speeds of trace can be set to measure only the very fine irregularities or to in-

clude also more widely spaced ones. This is similar to an automobile traveling over a rough cobblestone pavement. If the car travels very slowly, the car wheel has time enough to bounce up and down and follows the roughness of the pavement so that it hits every stone and depression. If the car travels at a high rate of speed, the inertia in the wheel-suspension mechanism will prevent the wheel from hitting every stone and depression so that, literally, the wheel hits only the high spots in the road. The resiliency of the wheel-suspension assembly and the speed of the car determine how often, or how much of the time, the wheels hit the pavement.

It would be desirable to have instruments of variable frequency response so that the instrument could be adjusted to measure roughness of short wave lengths as well as long wave lengths. These wave lengths to which an instrument responds at any time are defined by the instrument makers as the roughness-width cutoff. In the British Standard this is known as the "sampling length."

Roughness-Width Cutoff

Specifically, the standard defines roughness-width cutoff as "the maximum width in inches of surface irregularities to be included in the measurement of roughness height"; that is, the instrument will not recognize, and will not respond to, surface irregularities of greater width than the roughness-width cutoff.

The effect of variation in roughness-width cutoff can be understood better by reference to Figure 2. The profile at the top is the true profile of a surface having a roughness spacing of about 0.040 in.; the profiles below are the interpretations of the true profile with roughness-width cutoff value settings of 0.030, 0.010, and 0.003 in., respectively. It can be seen that the profile based on 0.030-in. roughness-width cutoff includes most of the coarse irregularities and all of the fine irregularities of the true profile; that the profile based on 0.010-in. roughness-width cutoff excludes the coarser irregularities but includes the fine

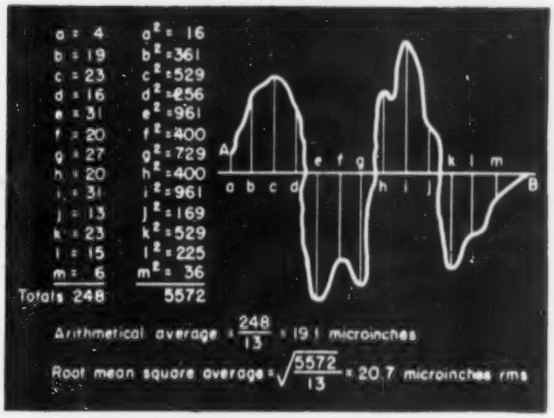


FIGURE 1. *Relation between RMS average and arithmetic average. The root mean square (RMS) average deviation, formerly used, is approximately 1.1 times the arithmetic average deviation, now standard in USA and UK.*

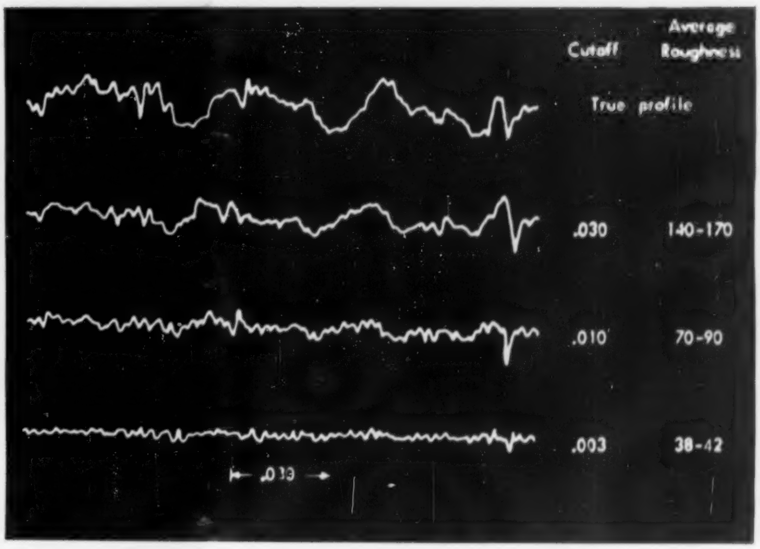


FIGURE 2. *The effect of variation in roughness-width cutoff. Shortening the roughness-width cutoff causes the instrument to read lower. Net effect is to make the surface appear smoother than it really is. Profile at top is true profile of a surface having roughness spacing of 0.040 in.; profiles below are interpretations of the true profile with roughness-width cutoff value settings of 0.030, 0.010, and 0.003 in.*

Courtesy General Motors

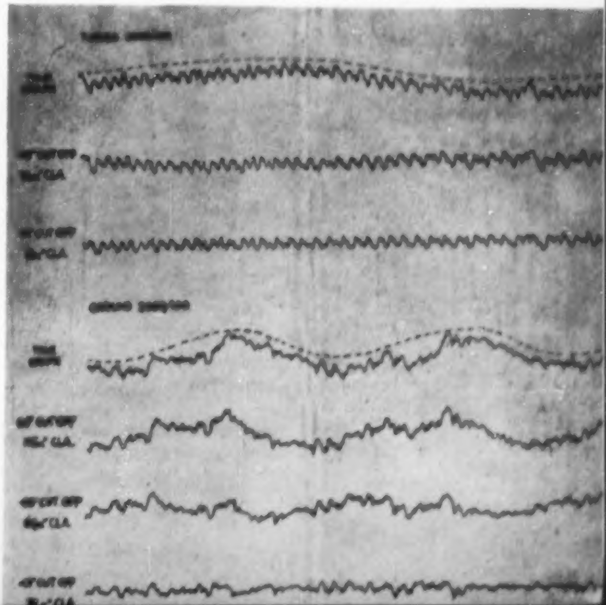


FIGURE 3. *Changing the roughness - width cutoff results in wider changes in instrument reading on rougher surfaces. This comparison between a turned and ground surface shows the true graph for each and the changes that occur in each case with changes in roughness-width cutoff. On the turned surface, the surface roughness reading is the same, 18 μ" CLA, at 0.030 in. cutoff and at 0.01-in. cutoff; on the ground surface, with 0.10-in. cutoff, roughness is 115 μ CLA; 0.03-in. cutoff shows 60 μ CLA; and 0.010-in. cutoff shows 32 μ CLA.*

and medium fine irregularities; and that the profile based on 0.003-in. roughness-width cutoff includes only the very fine irregularities.

In this example, the effect of reducing the roughness-width cutoff has been to reduce the roughness-height indication. However, had the true profile been made up of irregularities as fine as those of the bottom profile, the roughness-height indications would have been the same for all three roughness-width cutoff settings. In other words, all irregularities having a spacing less than the value roughness-width cutoff used are included in a measurement. Obviously, if the roughness-width cutoff value of an instrument is too small to include coarser irregularities of a surface, the measurements will not agree with those taken with an instrument having a wider roughness-width cutoff. For this reason, care must be taken to choose a roughness-width cutoff value which will include all of the surface irregularities it is desired to assess.

As has been stated, this roughness-width cutoff characteristic of an instrument is not very important when relatively smooth surfaces are being measured. But the effect becomes more pronounced as surfaces become rougher. Figure 3 illustrates this point very clearly. The surface profile at the top of the figure is relatively smooth. Therefore, the measuring instrument gives the same reading for surface roughness, 18 μ"CLA, when it is adjusted to a roughness-width cutoff of 0.030 in., as it does when adjusted to a roughness-width cutoff of 0.010 in. The lower part of the figure shows the profile of a much rougher surface. With the instrument adjusted to a roughness-width cutoff of 0.100 in., the surface appears to have a roughness of 115 μ"CLA; with the instrument adjusted to a roughness-width cutoff of 0.030 in., the surface appears to have a roughness of 60 μ"CLA; and, with the instrument adjusted to a roughness-width cutoff of 0.010 in., the surface appears to have a roughness of only 32 μ"CLA. Therefore, it is important for the design engineer to understand the full implication of specifying the desirable roughness-width cutoff when choosing a surface-roughness value for a part.

Specifying Roughness-Width Cutoff

As has been stated, the British call this roughness-width cutoff, "sampling length." However, if we view sampling length in the statistical sense as used in quality-control work, we can readily see that sampling length is really length of trace, or the distance over which the stylus travels in making a surface-roughness determination.

Statistically speaking, a sample is a small portion of the whole which adequately represents the whole. Where discrete units are being inspected, a sample is composed of several units. From discussions with Mr Reason of Taylor, Taylor and Hobson, manufacturers of the Talysurf, the British instrument for measuring surface roughness, it appears that the British will accept length of trace as the sampling length and substitute for their sampling length, roughness-width cutoff as defined by the American Standard. It is desirable to have the sampling length equal to at least five times the roughness-width cutoff for the instrument to give reliable readings. Therefore, this agreement on definitions between the British and Americans is important.

Up to this point, we have discussed surface roughness in general without reference to how the engineer can use surface roughness specifications in his work or how he chooses a particular value of surface roughness for any application. In presenting this background, it has been necessary to digress somewhat in order that the engineer might have an intelligent understanding of what is meant by surface roughness and how surface roughness is measured in order that he might establish realistic standards of surface roughness. If the design engineer has had some experience in surface-roughness standards, this background explanation will help him reorient his thinking. If he has not had such experience, he will be interested in how standards for surface roughness are established, since the standard furnishes no guide in this respect.

In actual practice, it has been found that a surface-roughness committee is best qualified for determining what degree of surface roughness shall be specified for a particular application. The surface roughness committee generally is composed of a quality-control engineer, a design engineer, and a manufacturing-methods engineer. When specifying surface roughness, consideration must be given to functional requirements of the surface, the tools and methods available for generating the surface, and methods for measuring surface roughness.

Experience has shown that surfaces which are too smooth for the application can be just as undesirable as surfaces which are too rough. Extremely smooth surfaces, running in contact with each other, create a problem in lubrication. Such surfaces may freeze together because of molecular adhesion. Rough surfaces may cause extreme frictional conditions. Hence, the surface roughness committee must decide which surface is best suited for the application.

Surface roughness should be specified only on those surfaces which must conform to, or meet, functional requirements. For all other surfaces, the finish resulting from the processing operations required to obtain dimensional accuracy should suffice. When a progam of surface-roughness specification and control is first adopted, with the enthusiasm of beginners, the tendency is to specify roughness on too many surfaces. Surfaces which fit the air, or which perform no particular function, generally are acceptable as finished by the regular operation. Profuse and loose usage of surface-roughness specification where not necessary detracts from the proper emphasis that should be given to important functional surfaces. When properly used, the designation and control of surface roughness in accordance with the American Stand-

ard will eliminate confusion and rejections, and will lower costs.

The choice of the degree of surface roughness wanted must be made on the basis of field or performance experience. Hence, it is important that the quality-control people and the manufacturing personnel be consulted before deciding on a definite value of surface roughness for any application. The final choice must be determined by such factors as type of loading, speed and direction of movement, physical characteristics of both materials in contact, type and amount of lubrication, and operating temperatures.

Reasons for Controlling Surface Roughness

It must be borne in mind that the primary reason for specifying that surface roughness be controlled within certain restrictions is to improve performance, increase effective service life, or reduce cost. The required data used for arriving at a decision as to which is the best surface must come from past experi-

(*Continued on page* 190)

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FINISHES- SURFACE ROUGHNESS - "SPECIFIC" U.S. NAVY APPLICATIONS   PH 196.5

THE FOLLOWING SURFACE ROUGHNESS NUMBERS HAVE BEEN ESTABLISHED AS STANDARD FOR "SPECIFIC" USE FOR U. S. NAVY WORK FOR APPLICATION TO THOSE SURFACES LISTED.

THE FOLLOWING TABLES SHOULD BE REFERRED TO AND THE LISTED VALUE USED, UNLESS THERE IS SOME SPECIFIC REASON FOR VARIANCE. (THIS TABLE WILL BE CHANGED FREQUENTLY TO INCORPORATE ADDITIONAL SURFACES AS THIS INFORMATION BECOMES AVAILABLE.)

IF THE SURFACE IN QUESTION IS NOT LISTED IN THIS TABLE, REFERENCE SHOULD BE MADE TO PAGE PH-197.1 AND SPECIMEN BLOCKS, IN ORDER TO DETERMINE THE "MAXIMUM" SURFACE ROUGHNESS NUMBER TO APPLY.

SEE PAGES PH-195.1 TO PH-195.4 INCL. FOR SURFACE ROUGHNESS STANDARDS, APPLICATION, ETC.

PART	SURFACE	ROUGH. NUMBER
CYLINDER	HORIZONTAL JOINT (STEEL)	63 (STEAM JOINT)
CYLINDER	HORIZONTAL JOINT (CAST IRON)	63 (STEAM JOINT)
CYLINDER	VERTICAL JOINT (STEEL)	63 (STEAM JOINT)
CYLINDER	VERTICAL JOINT (CAST IRON)	63 (STEAM JOINT)
CYLINDER	GLAND JOINT (WITH GASKET)	125
CYLINDER	GLAND JOINT (WITHOUT GASKET)	63 (STEAM JOINT)
CYLINDER	STEAM CHEST HORIZ. JOINT (WITHOUT GASKET)	63 (STEAM JOINT)
CYLINDER	STEAM SEAL FACE FOR BLADE RING	125
CYLINDER	STEAM SEAL FACE FOR DIAPHRAGM	125
BLADE RING	STEAM SEAL FACE	125
BLADE RING	HORIZ. JOINT (STEEL)	63 (STEAM JOINT)
BLADE RING	HORIZ. JOINT (CAST IRON)	63 (STEAM JOINT)
DIAPHRAGM	STEAM SEAL FACE	125
DIAPHRAGM	HORIZ. JOINT	125
GLAND CASE	HORIZ. JOINT	63 (STEAM JOINT)
GLAND CASE	VERT. JOINT (WITH GASKET)	125
GLAND CASE	VERT. JOINT (WITHOUT GASKET)	63 (STEAM JOINT)

NOTE:- SURFACES MARKED 63 STEAM JOINT ARE PRODUCED BY THE SHOPS BY MACHINING, GRINDING, LAPPING, SCRAPING, ETC., AS DESIRED TO END UP WITH REQUIRED SURFACE.

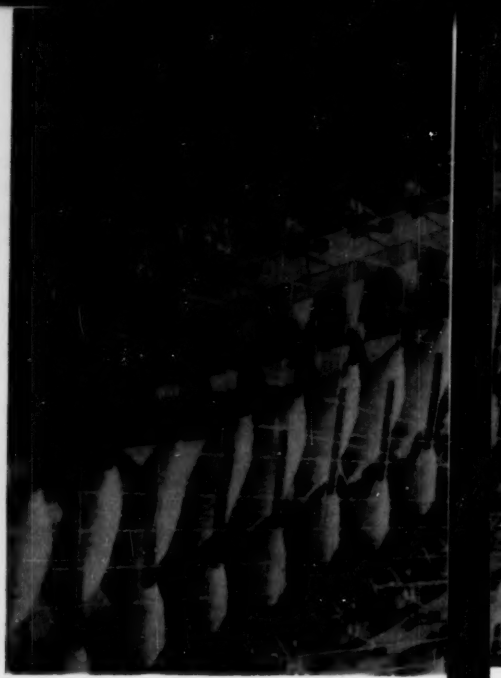
PART	SURFACE	ROUGH. NUMBER
SPINDLE	BODY (GENERAL)	125
SPINDLE	COUPLING FACE	63
SPINDLE	COUPLING FIT (TURN & B.)	63
SPINDLE	THRUST BRG. FACE	16
SPINDLE	THRUST EXTEN. FACE	63
SPINDLE	COUPLING KEYWAY (BOTTOM)	125
SPINDLE	CARBON GLAND AREA (METAL SPRAYED)	32
SPINDLE	BLADE GROOVES	
	BEARING SURFACE & FILLET	125
	NON-CONTACT SURFACES	250
SPINDLE	EQUILIBRIUM HOLES	63
SPINDLE	EQUILIB. HOLE RADII	32
SPINDLE	BODY RADII	63
SPINDLE	SHAFT END RADII	32
SPINDLE	JOURNAL	16
SPINDLE	INSPECTION HOLE	250
SPINDLE	BLADE DISC (SIDE)	63
SPINDLE	BLADE DISC (SHRINK FIT)	63
CROSS OVER PIPE	DIAPHRAGM STRESS FACES	32
THROTTLE VALVE	JOINTS (GASKET) (OTHER THAN WITH PHOTOGRAPH FINISH)	125
BEARING	BORE & THRUST FACES (BABBITTED)	32
PIPE	FORGED AND BORED (ADD NOTE - "ALL OVER - DO NOT USE SHARP POINTED TOOL")	250
FORGINGS (GENERAL)	ALL SURFACES (ADD NOTE - "ALL OVER - DO NOT USE SHARP POINTED TOOL")	500

PART	SURFACE	ROUGH. NUMBER
GEAR	HOUSING JOINTS (WITH & WITHOUT GASKET)	125
GEAR	HOUSING BRG. BORES	125
GEAR	JOURNALS	16
GEAR	O.D. OF TEETH	125
GEAR	FACE OF RIM	125
GEAR	GAP BETWEEN HELICES	250
GEAR	SHAFT (PRESS. FIT O.D.)	125
GEAR	CENTER (PRESS. FIT I.D.)	125
GEAR	COUPLING FLANGE FACE	63
GEAR	COUPLING FIT (T.&B.)	63
GEAR	THRUST BRG. FACE	16
GEAR	TOOTH CONTACT SURFACE	
	SHAVED	16
	HOBBED	32
GEAR	TOOTH FILLET	32
GEAR	PINION (BODY)	125
GEAR	ROTATING OIL SEALS (FELT SURFACES)	63

APPROVED - SURFACE FINISH COMMITTEE 6-17-52

REF

FIGURE 4. *Engineering standards sheets show surface-roughness values for various surfaces. This information is used by draftsmen in design work at Westinghouse Electric Corporation.*



AMONG *the fields represented in G*

Government

by WILLIS S. MACLEOD
Director, Standardization Division,
Federal Supply Service,
General Services Administration.

This paper was presented at the Winter Meeting of the National Electrical Manufacturers Association, Edgewater Beach Hotel, Chicago, March 13, 1956. For a discussion of the Department of Defense program, see THE MAGAZINE OF STANDARDS, *December*, 1955, *page* 366, *or* Government Industry Cooperation in Standardization (*Proceedings of the Sixth National Conference on Standards, American Standards Association, 70 E. 45th Street, New York 17, N. Y.* $3.00).

THE joint Department of Defense-General Services Administration (DOD-GSA) standardization team is designed to bring about, between military and civil agencies of the Government, uniform and non-duplicative purchase specifications and standards. Further objectives are a uniform Federal Catalog System to identify all items of Government supply, and non-duplicative inspection both as to procedure and inspection assignments. The complexities of the military and civil supply machines make it seem to most of us on the firing line that progress in standardization is slow. Definite progress is being made, however, in each of the areas I have mentioned.

The military standardization job is difficult not only because of the volume of supply and the diversity of items, but because of the vast domestic and foreign chain of supply involved. All recognize that adequate defense demands first priority and that military standardization must take precedence over that of the civil area. GSA's efforts are directed at military supply support in addition to its objective of sound civil agency supply management.

Conversely, Mr Gay[1] and his organization support the common area of Federal Specifications and Federal Standards. They agree that those military specifications and standards covering common items should ultimately become Federal Specifications and Federal Standards applicable to both military and civil agencies.

We are constantly striving to improve both the policies and procedures tailored toward these objectives. As an example, we have agreed on joint military and civil packaging policies—long a troublesome area.

Of major significance to NEMA and other industry groups is the crystallization of military and civil agency policy to utilize wherever possible the specifications and stand-

[1] Roger E. Gay, Director, Cataloging, Standardization, and Inspection, Office of the Assistant Secretary of Defense, (Supply and Logistics).

program for use of industry standards—laboratory glassware and textiles—

Industry Cooperation

in Development of Government Standards and Specifications

ards of industry, technical societies, and trade associations. This is the smart and economical thing to do. Past efforts in this regard have been diversionary. We are now on the road and are actually adopting for Government use industry standards which are recognized as national in character. I speak not only of utilizing and adhering to standards developed by NEMA but by the American Society for Testing Materials, Underwriters' Laboratories, Inc, and others, and those approved by the American Standards Association.

This is obviously one of the areas where the Government can save time and money by utilization of the technical efforts of industry and its technical groups through the use of standards already developed. Like any individual buyer, we cannot always adopt the industry standard "in toto." We often require some modification or supplementary requirement to meet special sets of conditions involved in Government use. This does not differ at all from the general practice of industrial buyers of modifying and supplementing the broad requirements of many of our nationally recognized standards. However, good practice certainly argues that extensive modification should be avoided, if possible, thus taking full advantage of lower costs and securing broader competition.

One of the problems which has "muddied" the Government's relationship with industry on standardization work has been the legal attitude toward trade association participation in industry advisory activities. Recognizing this, GSA worked out with the Attorney General a set of procedures governing the basis upon which technicians representing industry, technical societies, and trade associations can officially advise GSA in the development of Federal Specifications and Standards. These are prescribed in GSA Administrative Order 153, issued December 18, 1953, which had the concurrence of the Attorney General. This is the machinery under which GSA can now convene industry advisory technical committees and conferences to work out difficult technical problems involved in our standardization projects.

When he issued the Order, the Administrator said, "Issuance of this regulation emphasizes the important benefits to be derived by the Government from obtaining advice on matters related to procurement operations from people and firms actively engaged in developing and producing articles of the types bought by the Government."

He further stated, "Membership on GSA technical committees, of course, will be permitted only to fully qualified technicians whose experience and skill will benefit the

Government. We have in the past solicited information from such specialists, including representatives of technical societies and trade associations, and we now feel that the granting of the privilege of direct participation in this work—which so vitally affects both the Government and industry—is a long step forward. We think it will have a salutary effect on our objective of making relations between business and Government as close as good practice permits."

The significant thing about this Order is that for the first time, to my knowledge, a technical representative from a trade association is permitted to participate in advisory technical conferences and technical committees coequally with representatives of other societies, associations, and producing concerns.

This action supplements but does not modify the established practice of consulting not only with individual suppliers but with organized groups such as NEMA in the formulation of Federal Specifications and Standards. In addition, we will continue to obtain written comments and recommendations from these sources on each of our specifications and standards. We urge that NEMA continue to initiate recommendations for new specifications and standards or for revision of existing ones as progress and changes occur in industrial production.

It is of note that we have adopted, in complete or partial form, more than 1200 industry standards. A great many more are being used in our day-to-day purchasing and their origin is being acknowledged. The end products covered are items for which the development of standards is difficult and costly.

The industry standards which are of great significance for Government adoption are typified by American Standards, by ASTM standards, those of Underwriters' Laboratories, Society of Automotive Engineers, American Society of Mechanical Engineers, American Iron and Steel Institute, Copper and Brass Research Association, and NEMA.

I ascribe to American Standards

Standard Oil Co. (N. J.)

—road and paving materials—

the highest acceptability for use by the Federal Government because they represent the fullest participation in reaching a consensus of all parties at interest. Next in line, obviously, would be standards developed by the technical societies themselves, such as ASTM, which standards likewise reflect the viewpoints and interests of the producer, distributor, and user.

The third is the trade or producer-related standard generated by groups like NEMA. It is recognized that these reflect in considerable degree the interest of users. The point to be made, however, is that the user does not formally participate in their development. From our standpoint, this further extension of participation or the processing of a NEMA standard through the American Standards procedure offers the best potential for Government adoption. I hasten to say that, of course, we do adopt NEMA and other industry group and technical society standards where these are found to be adequate to our needs. I do urge your every support of the American Standard principle!

A few examples will illustrate the use now being made of industry standards. ASTM standards have been adopted for petroleum test methods, organic plastics, laboratory glassware, and will undoubtedly be adopted subsequently in such fields as leather, textiles, soaps, and rubber. In road and paving materials both ASTM and the American Association of State Highway Officials standards have been adopted. We use the American Chemical Society standards for reagent chemicals and TAPPI standards for paper products. American Standards are almost universally used as applicable in our Federal Specifications and Standards. This is particularly true with regard to dimensional characteristics.

We are presently processing a Federal Standard which, when promulgated, would require that the American Standard Requirements for Transformers, C57.12a, be referenced in all Government specifications, and invitations to bid, to which applicable.

Now let us review for a moment where we stand in our standardization program in order to point up the magnitude of the problem. The Government, buying as it does under a truly competitive system of

supply, must necessarily concentrate its standards activities on end products. There are now 3624 Federal and Interim Federal Specifications which is about one-half of what we need. We ought always and do, wherever possible, specify performance rather than composition, construction, or design characteristics.

We have issued 73 Federal Standards, the majority of which are commodity "limitation" standards. This field is wide open for standardization.

For the last three years we have produced specifications and standards under what we call the "assigned agency" method. This means the standardization project is assigned to the agency having greatest concern and the requisite technical staff. The GSA staff, in addition to doing a goodly number of the projects themselves, follow through on the assignments and assist in the coordination with other agencies.

Congress has provided funds for the cataloging during this fiscal year of 28,000 GSA Stores Stock and Federal Supply Schedule items. During fiscal year 1957, an additional 102,000 items will be cataloged if Congress appropriates the funds we have requested for this work. By the end of 1957, then, all of the GSA items of supply will have been cataloged in the Federal Catalog System.

The Cataloging Division under Colonel Joe De Luca[2] and ourselves have continuously worked together since the inception of the Federal Catalog Program to develop the best methods, procedures, and policies—the "production tools" for the uniform item identification and numbering of the supply items under the Federal Catalog System. While we operate under two basic laws, we are required to coordinate our efforts to achieve a uniform catalog that will be used by all agencies, civil and military, in their supply activities. This, I am delighted to say, we are doing, and what is more, Mr Gay's office is lending us every assistance in getting our phase of the catalog job done.

[2] Colonel Joseph R. DeLuca, Staff Director for Cataloging, Office of the Assistant Secretary of Defense (Supply and Logistics).

To identify a single item in the Federal Catalog System the GSA identification for that item must be compared with that of the military item to determine whether the items are identical. If so, the Federal Catalog System identification and number are adopted. If they are not identical, GSA must write its own description of the item and secure the Federal Catalog number from the Department of Defense.

Completion of the identification of the GSA item is, of course, essential if we are to continue supply support to the military and civilian agencies. However, if the Catalog System is ever to be really effective in the Government, all of the remaining civil agency items, some 770,000, must be identified in the new system. When that has been accomplished, the following benefits can be fully realized by the Government:

1. Reduction in the number of varieties, types, and sizes of similar items; the elimination of duplicates and of specials.
2. Establishment of a uniform language of supply, simplifying administration and eliminating misunderstanding.
3. Increased purchase volume and lower unit cost by concentrating purchases on fewer items.
4. Reduction in stock inventories and increased rate of turnover.
5. Better supplies and equipment through standardization made possible by uniform identification.
6. Greater vendor competition and broader sources of supply through concentration on the uniform list of supply items; better utilization of supplies and equipment, and excess stocks; and the more orderly disposal of surplus and obsolete stocks.
7. Lastly, easier determinations of interchangeability and substitutability of items.

Now we come to the question, "What can NEMA and other industry groups do to help advance Government-Industry cooperation?"

To repeat, in government we obviously must deal with the actual end item of supply purchased. We can utilize fully all of the standards developed for engineering science, engineering measurement, physical values, constants, and nomenclature. Without them, it is questionable whether we could develop a good Federal Standard. However, we must get down to cases and define precisely the required quality of end item to be supplied to the Government under a fully open and competitive system of supply.

We must clearly differentiate in Federal Specifications the types and qualities of the end items which are required for the several applications involved in Government use. This then does not admit of our adopting a general minimum standard or a specific performance test method which does not make it possible to compare the several levels of performance generally available in the market.

Where end product standards of industry are available and where the quality level is that required by the Government, we use such standards. But I know of scarcely any area of end products involved in Federal supply which is adequately covered today by end-product standards nationally recognized in character.

For example, NEMA has a standard on fans, but it covers primarily test methods and does not constitute a procurement document. I am told that the reason we could not adopt the NEMA methods of test was because they are rather extensive, expensive, and difficult to reproduce. The staff believes that the thrust method of test developed by the National Bureau of Standards is much more satisfactory for our needs. It may be that there is some basis on which the two methods of test could be reconciled, or you may determine that the Bureau's method has some advantages over your own methods of test.

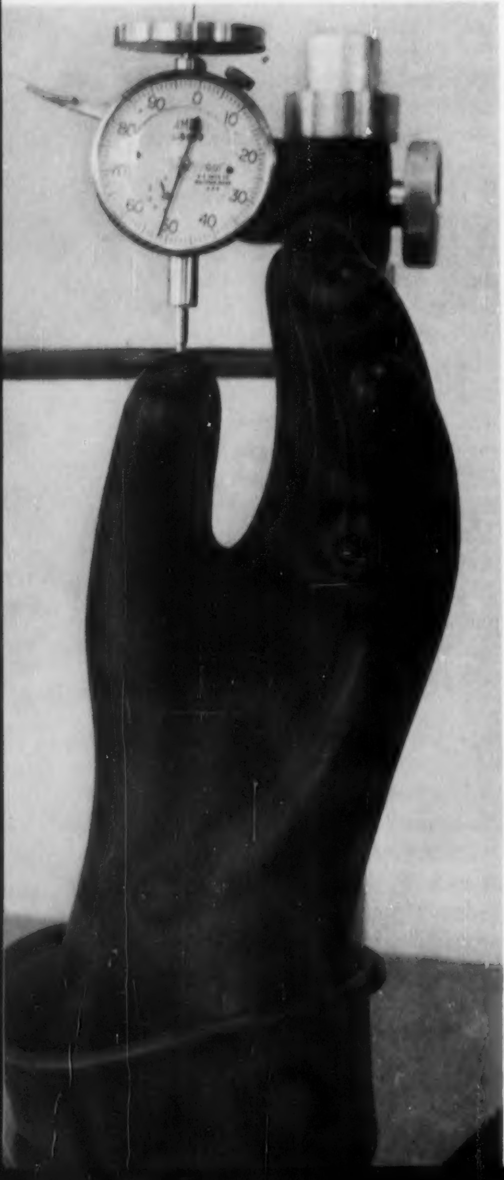
As to the performance part of the NEMA standard on fans, we have adopted NEMA's watts maximum input and the noise level on the radial discharge type fan.

NEMA has given us a great deal of help in developing satisfactory Federal Specifications which reflect products of requisite quality to meet Federal requirements. The NEMA subcommittee chaired by Findley Gordon worked closely with us to

• • —*plastics*—

• • —*rubber*—

Consolidated Edison



develop Federal Specification W-S-00414 (GSA-FSS) for General Purpose Lighting Fixtures for Fluorescent Lamps.

Our records show that as early as 1938, NEMA and the old Federal Specifications Electrical Supplies Committee worked very closely in developing Federal Specifications CC-M-636 on Fractional-Horsepower Motors and CC-M-641 on Integral Horsepower, Alternating Current, Motors. The Federal specification and the NEMA Standards appear to be in agreement throughout. This is the most usable kind of industry standards job from the Government viewpoint.

Our Federal Specification W-T-631 for 60-cycle, single-phase, distribution transformers was originally developed in 1942 with considerable help from NEMA. In fact the specification was based largely on an existing NEMA Standard. We are now revising our specification in order to bring it in line with the latest Edison Electric Institute-NEMA Standard.

What we want NEMA and other industry groups to do is give us more of this kind of help in developing end product standards for such items as electric water heaters, electric ranges, electric fans, wiring devices, furniture, tires, glassware, and textiles, to mention a few, where different applications would justify different quality levels.

You may have the impression from what I have been saying that this business of getting help from you and other technical groups and societies is a one-way proposition. This is not the case—it is definitely a two-way street. Of the more than 3600 Federal Specifications and Standards, universally accepted within the Federal Government, many are perfectly suitable as they now stand for widespread adoption in industry. They are yours for the asking! We feel that a good many of these specifications, time tested by Government agencies, are ideally suited for the needs of a large body of the consuming public and private businesses, as well as for our Federal requirements. The adoption by industry generally of a specification or standard of our making has the same beneficial effects as has the reverse procedure. The net result is better buying, more utility for each dollar spent, as well as reduced cost in doing business.

One of the Federal Standards issued in November 1954 covers Shockproof Cable Terminals and Receptacles for Use on X-ray Equipment (Radiographic and Fluoroscopic). Use of this standard will achieve interchangeability in all such terminals and receptacles, as there will be one standard for all dimensions whereas previously the dimensions of different manufacturers' products varied widely. Adoption of this standard will result not only in monetary savings, but also

Charles Phelps Cushing

• • —*soaps and detergents*

in possible saving of human life. The American Standards Association has this standard under consideration for adoption under the co-sponsorship of NEMA and GSA. In addition, plans are under way to reconcile a proposed British Standard with the requirements of the Federal Standard. In time it may become an international standard, with resultant savings to all who use it.

We in GSA cannot overemphasize the economic aspects of the standards activity in Government. This is because of the vast savings which result. The Federal Government buys nearly 3,000,000 different items. The number of technically "different" things becomes almost infinite. But some of the differences are infinitesimal. For Government purposes they are needless and expensive. By the development of one furniture standard we cut the number of steel clothing lockers from 136 items to 10. No efficiency in performance or utility was lost. But the savings achieved in one year will exceed by many times the cost of developing the standard.

Through the 61 commodity limitation standards developed thus far, covering before standardization some 2500 items, we eliminated some 2100, or a reduction of about 85 percent. This is perhaps too austere a reduction to project across-the-board. A more realistic percentage might be something in the neighborhood of 50 percent. However, it does illustrate what can be done through standardization to eliminate unnecessary and wasteful items from the supply system.

Another advantage to GSA in standardizing is that it helps our policy of equalizing business opportunities. We must ensure that small firms as well as large ones can bid on a common basis. Some 60 percent of our regular requirements are supplied by small firms. By stating our needs in clear, simple terms involving as few items as possible, we help the smallest member of the industry to bid for government business.

Many of us in government believe that certification as applied to the acceptability of a manufacturer's product under the requirements of a standard purchase specification is virtually untapped as a general practice. The Federal Specification for Electric Fans makes use of certification to establish the manufacturer's compliance with the requirements. The manufacturer certifies his product by test against the requirements of the specification in his own laboratory provided it is approved by the Government, in a commercial laboratory acceptable to the Government, or by a Government testing laboratory at the manufacturer's cost. The supplier may choose whichever basis he wishes.

By submitting a certification test report, he then demonstrates compliance with the specification prior to contract award. This avoids the need for establishing a formalized Government Qualified Products List, introduces economies on the part of both the supplier and the Government and, more important, sets up a self-certification procedure. It minimizes the extent and cost of plant inspection.

Any such system of quality certification must be based upon a recognized standard for testing and evaluating quality and should be backed up by production line quality control or quality assurance. I have long felt that the Federal Specifications are way behind in applying this technique, though the military are making progress in this field. Greater progress would be assured if groups like NEMA initiated certification projects based upon recognized standards along the lines of the American Standard certification procedures Z34.1-1947.

The electrical industry is way ahead of many others in its efforts to standardize. This is good, and more power to you! The Government, more than ever before, would like to join its efforts wherever possible toward this common principle. It is obvious that you are aware of the great monetary and intangible benefits from standardization. Your Government has the same stake as you do, and more so because it is your money we are trying to save. Let us both keep up the good work!

NEWS BRIEFS.....

• Much of the material contained in the American Standard Safety Code for Mills and Calenders in the Rubber Industry (B28.1-1949) was used by the Industrial Accident Prevention Associations of Toronto, Canada, in developing new safety standards. The handbook, Safety Standards for the Rubber and Plastics Industries, is for use by the members of the associations. The handbook was prepared by the Leather, Rubber and Tanners Section of the IAPA through cooperation with the American Standards Association and the International Labor Office. Material secured from a number of large rubber companies represented on the committee is also included.

The handbook represents minimum standards necessary for the safety of workers.

• The National Standards Committee of The American Society of Tool Engineers has announced publication of a revised Data Sheet Numerical Index, adapted from the U. S. Standard Commodity Classification System.

Designed by tool engineers for the use of tool engineers, the ASTE Index is intended to help in selecting, filing, classifying, and comparing tool engineering products.

The Index is primarily intended to establish a comprehensive system by which ASTE Data Sheets and related information may be filed, but is not a listing of available Data Sheets. ASTE announces that it can also be used to number and file the mass of engineering information and data that constantly accumulates.

The ASTE Index comes in two parts: (1) The Numerical Listing—which is abridged, but shows the basic structure and logic of the ASTE Edition, (2) The Alphabetical Listing, which is merely a cross reference index of the same numerical material expanded for the specialized use of the tool engineer.

Inquiries should be directed to National Standards Committee, American Society of Tool Engineers; 10700 Puritan Avenue, Detroit 38, Michigan.

• *Business Week* is the most recent publication to follow the recommendations of American Standard Z39.1-1943. From now on the table of contents of each issue will be on page 1, facing the inside cover.

Letters to the editor following announcement of the change show that this move has brought enthusiastic response and is greatly appreciated.

American Standard Z39.1-1943, Reference Data and Arrangement of Periodicals, recommends: "Print contents in a uniform place, not combined with other text, preferably opposite inside of front cover."

Other recommendations in the standard cover data needed for identification; bibliographic information; information to be included on title page, table of contents, and index; when to make changes in volume numbering; and how to handle supplements.

Much of this information has been incorporated in a check list for publishers issued recently by the Special Libraries Association and given wide circulation.

• Standards for materials and for testing of materials used in nuclear energy development, particularly in the construction of reactors, will receive special attention by the American Society for Testing Materials. A Special Administrative Committee on Nuclear Problems has been organized by the Society. Its scope is (1) to advise the technical committees of the Society on nuclear problems pertinent to their respective scopes, (2) to stimulate the undertaking of research and standardization projects, specifically related to nuclear energy, on the part of the technical committees, and (3) to review periodically the status of the work.

As the first step in coordination, ASTM Committee E-10 on Radioactive Isotopes has been asked to expand its title and scope to investigate, promote, and advise on techniques and standards for measuring changes in properties and constitution of materials as a result of radiation exposure. The Special Administrative Committee agreed that basic procedures for specimen preparation, exposure to radiation, and special techniques for measuring properties after exposure could be developed by Committee E-10. (See news item on page 184.)

The Atomic Industrial Forum and ASTM will sponsor jointly a symposium on radiation effects on materials at the ASTM Pacific Area National Meeting in Los Angeles, September 17-21, 1956. Additional papers sponsored by Committee E-10 concerning radiation effects and radioisotope uses will be included in a companion symposium.

In advancing its work, the Special Administrative Committee will establish a list of materials used in reactors as a basis for future technical committee activities. Information will be obtained from the technical committees on current and planned activities regarding engineering materials in nuclear reactors (including nuclear fuels) as well as the property changes in engineering materials exposed to nuclear radiation. Members of the committee are:

N.L. Mochel, Manager, Metallurgical Engineering, Westinghouse Electric Corp, Chairman

G.D. Calkins, Assistant Division Chief, Batelle Memorial Institute

C.L. Clark, Research Metallurgical Engineer, Timken Roller Bearing Co, Steel and Tube Division

M.A. Cordovi, Chief Metallurgist, Atomic Energy Division, The Babcock & Wilcock Co

G.M. Kline, Chief, Division of Organic and Fibrous Materials, National Bureau of Standards

F.L. LaQue, Vice-President and Manager, Development and Research Division, The International Nickel Co, Inc

F.C. Linn, Aircraft Nuclear Propulsion Division, General Electric Co

J.C. Robinson, Chief, Engineering Development Branch, Division of Reactor Development, U.S. Atomic Energy Commission

J.R. Townsend, Director, Material and Standards Engineering, Sandia Corp

H.A. Wagner, Assistant Manager of Engineering, The Detroit Edison Co

C.C. Woolsey, Group Leader, Materials Technology, North American Aviation, Inc

• Dr Hubert R. Snoke, nationally known authority on bituminous roofing materials, has been named assistant chief of the Building Technology Division, National Bureau of Standards.

Dr Snoke will continue as chief of the Floor, Roof, and Wall Covering Section. His four survey reports on the extent and use of different types of roofing materials and their weathering qualities in the United States are widely recognized both here and abroad. He has also directed the work on asphalt at the Bureau, which has been conducted jointly for 30 years with the Asphalt Roofing Industry Bureau.

Dr Snoke is chairman of ASTM Committee D-8 on Bituminous Waterproofing and Roofing Materials.

• F. C. Frost, Civil Engineer in charge of building, materials, and mining projects of the American Standards Association, attended a modular measurement conference in Europe early in May. Mr Frost was invited by the International Cooperation Administration to participate in the conference as the USA representative. The conference, organized by the European Productivity Agency, was held at Milan and at Rome, Italy, May 4 and 8.

• The Industrial Medical Association recently became a member of ASA's Safety Standards Board.

At the organization of the Canadian Section of the Standards Engineers Society—left to right, William L. Healy, General Electric Company, past-president, SES; George Noble, Dominion Engineering Works, chairman, Canadian Section; George Foster, chairman, Screw Products Committee, Canadian Standards Association.

• George Noble, standards engineer, Dominion Engineering Works, Montreal, has been elected chairman of a Canadian Section of the Standards Engineers Society. The section was organized at a meeting in Montreal, March 8.

William L. Healy, past president and one of the founders of the Society, was guest speaker. Mr Healy is associated with the General Electric Company, Philadelphia, and is co-author of *Simplified Drafting Practice*.

In spite of the worst snowstorm of the season, 35 persons attended the meeting.

Executive officers of the Canadian section are, in addition to Mr Noble, M. J. McKerrow, Electronics Division, Canadian Westinghouse Company, Hamilton, Ontario, vice-chairman; H. D. Keil, standards engineer, Canadian Industries Ltd, Montreal, secretary-treasurer; Rowland Hill, Northern Electric Company, Ltd, executive member; and Mrs M. Vogel, standards supervisor, Aviation Electric Company, Ltd, Montreal, executive member.

• The use of Modular Measure for housing constructed for the military departments will have statutory backing if a bill (H.R. 9893) passed by the House of Representatives April 13 becomes law. Section 417 of the bill calls for use of "the principle of modular design" in "family housing and other repetitive-type buildings in the Continental United States," to the "extent deemed practicable." This section was added on recommendation of the House Committee on the Armed Services. Following its passage by the House, the bill has been sent to the Senate for its consideration.

Neither the Senate Committee on the Armed Services nor its Subcommittee on Real Estate and Structures has yet acted on the Senate's companion bill, S.3122.

In recommending addition of Section 417 to H.R. 9893, the House Committee on the Armed Services pointed out in its report: "Modular measure simply uses a 4-inch unit of measurement in the planning of buildings. A module is merely a dimensional unit that is used repetitively. Manufacturers of building materials are now changing to stock sizes that are multiples of 4 inches. Thus far the most extensive conversion of buildings to modular sizes has been with concrete block, wood

and metal windows, brick, wallboards and insulations, flue linings, glass block, certain finish materials, and related products. This conversion has not been extended by all industries or all manufacturers of building materials but certainly the trend is in the right direction. These modular-size materials fit together with greater ease and efficiency when used in a building planned for modular coordination.

"This increased construction efficiency means lower building costs. Present experience with modular coordination indicates that it will save the American people millions of dollars per year in the cost of new buildings for industrial, government, and military use. . . .

"The use of modular coordination is endorsed by such organizations as the American Standards Association, American Institute of Architects, Associated General Contractors of America, and is being used extensively by architects and industry throughout the country."

The Department of Defense has already endorsed Modular Measure. At a hearing before the House Armed Services Committee, Roger W. Fulling, the Department's Con-

(*Continued on page* 182)

What Is Your Question?

What color is identified in a Canadian specification as 1 GP-12a, Color tab 1-107?

Canadian government specification 1 GP-12a identifies color tab 1-107 as light gray, glossy. The specification, issued by the Canadian Government Specifications Board, can be obtained from the National Research Council, Ottawa, Canada, or ordered through the American Standards Association.

•

Are there any standards to guide in the use of color in painting machinery and walls inside a factory?

Three American Standards may be applicable. One of these is the American Standard on Gray Finishes for Industrial Apparatus and Equipment, Z55.1-1950. This specifies and identifies four shades of gray for use on factory equipment.

The American Standard Scheme for Identification of Piping Systems, A13.1-1956, specifies what colors are to be used in identifying the type of materials carried in piping systems. However, the standard recommends that legends be the primary method of identification rather than color.

The American Standard Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1953, recommends and defines the colors to be used for marking hazardous locations, calling attention to safety equipment, and identifying fire equipment and other protective equipment.

In addition to these American Standards, several of the paint manufacturers have developed schemes, although not standards, for using color in factories and on equipment.

•

Are there standards for valve sizes? A recent circular stated that basic sizes of valve bonnet shields had to be designed because no valve size standards existed.

There are American Standards for face-to-face dimensions of valves and for pipe flange fittings. The height of the valve stem seems to be the only dimension essential to the design of the shield that is lacking in these standards. The dimensions standardized are those that are essential for interchangeability of valves.

SECOND EDITION

THE 400

AMERICAN STANDARDS IN THE ELECTRICAL FIELD

8½ x 11 heavy paper cover 68 pp

Lists, describes, and indexes American Standards and International Recomendations of direct concern to the electrical industry.

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- List of American Standards, with brief description of contents of each.
- What the International Electrotechnical Commission is; list of active technical committees and subcommittees; and list of IEC recommendations.
- List of USA technical advisors on international work.
- What the CEE is and list of current CEE publications.
- List of projects under jurisdiction of the Electrical Standards Board and the Acoustical Standards Board, with names of project sponsors and officers.
- ASA and its services
- Price list of American Standards (listed by symbol), IEC recommendations, and CEE publications.
- Index to standards.

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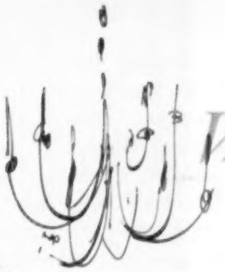

What Is a Double?

Reprinted from Trade Information Service, *published by the Retail Trading - Standards Association (Incorporated), London, England, which in turn had reprinted this amusing little item from the* Evening Standard, *London.*

Penny Drexler

There is no standard size for a double bed. So the defense contended at Bournemouth this week when charged with applying a false trade description to a 68 x 87 in. blanket by calling it "double-bed." But the magistrates agreed with the prosecution that 80 x 96 in. is the smallest deserving to be called double, and imposed a fine.

Disagreement with the law brings small profit, but it must be pointed out that the whole of history runs counter to the confidence of the magistrates. Only one bed of standard, immutable dimensions has ever been known. This was the bed of Procrustes, the robber, who would stretch his guests to fit if they were too short, and cut them down to size if they were too long.

With this exception, the size of beds has always varied with the tastes and inclinations of their owners. Cardinal Richelieu had a bed, whose area it is best to visualize as a fraction of an acre, from which he would never be parted. Teams of scullions would transport it on his travels, and breached walls and enlarged doorways marked the cardinal's course through France.

Richard III would also not be parted from his bed, and slept in it at Leicester the night before Bosworth. But this attachment was due to the fact that he kept his money in it. Its size is not recorded. Louis XIV had 413 beds, most of them enormous. Ludwig II of Bavaria had a bed shaped like a cathedral.

On all these beds, the 80 x 96 which the magistrates dignified as double size would look like a wisp, a speck, an inconspicuous shred. On the other hand, the size condemned would be quite wide enough for the beds which in the American pioneer days were advertised: "Admission five cents. 10 cents with supper. No more than five to share, and boots must be removed before retiring."

Built-In Reviver

Many people too, the magistrates might have recalled before imposing a penalty, are indifferent to the size of their blankets, being much more concerned with good fittings. Beds of this description include the model once displayed in New York with an oxygen mask for hangovers; the type with the built-in mechanical sheep-counter; and those with a drawer filled with a special type of biscuit that leaves no crumbs.

This Bournemouth decision is, in fact, to be deplored as yet another instance of the constriction of the human spirit in a field where it longs to flower.

(*Continued from page* 180)
struction Director, testified on the savings made possible by the Modular system. At the same hearing, Franklin G. Floete, then Assistant Secretary of Defense: Properties and Installations, declared that the Defense Department "would have no objection to this type of legislation, which would give statutory impetus to the Modular [Measure] principle."

From ISI booklet of posters shown at Indian Industries Fair.

• The Indian Standards Institution told the story of standards and what they mean in better service and interchangeability in an exhibit at the Indian Industries Fair at New Delhi late last year. The exhibit was awarded a "highly commended" certificate for art in industry. It showed materials, components, and finished products for which Indian Standards have been prepared or are being specified. A series of cartoon posters dramatized the idea "Nonconformity to standards leads to numerous difficulties" and "Standards eliminate costly experiments."

• Clarence H. Linder, Vice-President—Engineering, General Electric Company, will talk on "Standardization—Virtue and Necessity" when he presents the Second Charles A. LeMaistre Memorial Lecture on June 29. The Lecture is a feature of the meeting being held by the International Electrotechnical Commission at Munich. It was established to bring before the IEC the views of an international figure in the electrical industry on some broad aspect of electrical engineering.

• "Strength Through Standards" was the theme of the Twenty-ninth Annual Meeting of the Canadian Standards Association, June 8. The meeting was held at the Nova Scotian Hotel, Halifax.

Dr M. R. Foran, Professor of Chemical Engineering, Nova Scotia Technical College, was guest speaker. His subject was "Strengthening the Provincial Partnership Through Standardization."

The CSA has completed its thirty-seventh year of service.

• Plans for a Modular Building Council, starting a new phase in the building industry's conversion to modular dimensioning, were announced by the Producers' Council May 14. The announcement was made at the Council's Spring Luncheon at Los Angeles, held in conjunction with the American Institute of Architects' convention.

William Gillett, president of the Producers' Council, explained that the purpose of the Modular Building Council will be to broaden financial support for the modular dimensioning program. This will make it possible to establish a technical staff to work with the American Standards Association in further development of the Modular Measure technique and in extending its applications, he said. Individual memberships will be encouraged, making it possible for architects, contractors, and others who are interested in the Modular dimensioning system to join in the effort to speed industry-wide adoption of the system.

The American Standard Basis for the Coordination of Dimensions of Building Materials and Equipment, A62.1-1945, provides a 4-inch module on which the entire Modular dimensioning system is based. Using this 4-inch module, it is necessary to work out coordinated dimensions for materials and equipment so they will fit together without special work at the site. Provision must be made for mortar and different types of fastenings in the over-all dimensioning plan, as well as in the dimensions of the individual materials and equipment. A technical staff is needed to do this work before the system can be applied to additional building units and materials.

As Mr Gillett explained, "The Modular Measure campaign is now nearly six years old. The success of this effort has been evidenced in many ways until now it is an accepted method of dimensioning and there is no doubt that it will become universal practice in building. Perhaps the most significant effect of this program to date has been the awakening of enthusiastic, active interest on the part of countless practitioners of Modular Measure, not only producers and architects but also contractors, builders, estimators, draftsmen, job superintendents. Along with this there was developed a revival of interest among materials producers who do not, as yet, make Modular-size units. It is in answer to these new needs of the growing program that the Modular Building Council is being established."

Sponsors of Project A62 are the American Institute of Architects, the National Association of Home Builders, the Producers' Council, and the Associated General Contractors of America.

Modular Measure is an essential part of the present trend toward industrialization of the U. S. construction industry, declares the Modular Coordination Office of the American Institute of Architects. "Industrialization calls for factory-fabrication of building parts, which are then distributed and stocked until ordered, finally delivered to the building site and assembled there without refabrication. Just as in other industries, this reduces cost. Modular Measure encourages economical use of standardized building materials; it does not result in standardization of design. The 4-inch module is small, gives the designer ample freedom. (A Module is merely a dimensional unit that is used repetitively.) Modular colonial-style houses, modular Gothic churches, modular contemporary schools and hospitals now exist throughout the country."

ASTM News

• Action was taken to expand American participation in international standardization activity on cast iron at the meeting of ASTM Committee A-3 on Cast Iron, March 1.

At the last meeting in England of ISO/TC-25 on Cast Iron, USA participated in work leading toward international specifications for gray iron castings. International task groups have also been organized on (1) malleable iron, (2) nodular iron, and (3) methods of testing. At the March 1 meeting of Committee A-3, W. A. Kennedy of Grinnell Company was appointed as USA representative on the Malleable Iron Task Group; T. E. Eagan of Cooper-Bessemer Corp., as USA representative on the Nodular Iron Task Group; and G. A. Timmons as USA representative on the Testing Methods Task Group.

A new subcommittee on austenitic cast iron has been organized by Committee A-3 and will start work toward the development of specifications for this product.

Revisions in several existing cast iron specifications have been approved by the committee and will be submitted to ASTM for approval at the Annual Meeting. In Specification A 48 for Gray Iron Castings, a new class 45 has been added. Several other revisions concern the choice of test bars. The test bars presently prescribed have received various criticisms and Committee A-3 took the first step in overcoming these objections by appointing a special task group to conduct an over-all survey of test bar design for determining properties of cast iron.

The next meeting of the committee is being held at the time of the Society's Annual Meeting, June 17-22, 1956.

• ASTM Committee D-9 on Electrical Insulating Materials has accelerated its program to develop suitable test methods to characterize the thermal capabilities of insulating materials which go into electrical equipment. This is in line with increasing emphasis on the need of the electrical industry for classification of insulating materials based on performance and test rather than on definition. Through cross-representation the committee is cooperating with the American Institute of Electrical Engineers in this effort. The committee is also actively engaged in the development of methods for testing the effects of corona discharge on electrical insulation. A base line for this work was provided by a symposium on corona, held in the fall of 1955.

At its meeting February 13-15 the committee started work on a program toward development of methods of test for magnet wire insulation. The tests will be useful in connection with national standardization work on magnet wire which is centered in ASA Sectional Committee C9, on which ASTM Committee D-9 is represented.

An outstanding feature of the committee meeting was a symposium on minimum property values of insulating materials. Often the minimum value for a particular property is the controlling factor in application of insulating materials. The papers presented outlined the present status of progress toward establishing these minimum levels for several important properties related to service conditions.

Closely related to the problem of minimum property levels is that relating to significance of tests. The committee has revised its previous recommendations related to significance and usefulness of tests and has submitted the new recommendations for publication by the Society.

Natural mica is one of the best dielectric materials known and the committee is currently engaged in an intensive effort toward improving the existing specifications for mica. New revisions of the mica specifications are currently being considered for recommendation to the Society and publication of the revisions is expected within a few months.

The committee is holding its next meeting on the occasion of the 1956 annual meeting of the Society, June 17-22.

• Carbon black, which is used extensively in rubber, plastics, paints, and printing ink, is the subject for a new activity in ASTM.

Because of the large number of varieties of carbon black available and the need of characterizing their physical properties, it has become evident that standards, particularly test methods, are needed, ASTM points out. A group representing the carbon black producers developed a number of test methods for carbon black which were presented to ASTM for consideration. Since all ASTM standards must have the approval of consumers, as well as producers, ASTM Committee D-24 on Carbon Black was authorized to provide this balanced consideration.

At a meeting to discuss organization, held February 29, a proposed scope of activities and a tentative organizational plan were approved. Since carbon black is used extensively in rubber, plastics, paints, and printing inks, coordination will be effected with other ASTM committees concerned with these materials.

The new committee is holding its first full-scale meeting in conjunction with the Annual Meeting of the Society, June 17-22.

• Much interest was expressed in building construction testing standards at a meeting of ASTM Committee E-6 on Methods of Testing Building Constructions, February

28. A revision of the scope of the committee was proposed for approval by ASTM's Board of Directors. It will take cognizance of the interest of the committee in housing structures and of the desire to effect close liaison between building code authorities and ASTM in relation to their needs for standard test methods of building constructions.

New projects discussed for possible consideration included the whole subject of load tests upon completed structures, the testing of window assemblages, and the place of connections in structural testing.

The reorganization of the committee was completed, with the appointment of J. P. Thompson, National Bureau of Standards, as Assistant Secretary in charge of membership. R. F. Legget, National Research Council of Canada, is chairman. More complete liaison with other ASTM technical committees has been established, with representatives from 12 committees.

A new project was approved for the preparation of standard test methods for determining the strength of masonry assemblages and reinforced brick masonry construction. The committee will also study the development of standard test methods for vapor barrier materials for use other than strictly as insulation; for example, vapor barriers used for covering crawl spaces beneath houses and for use under concrete foundation slabs placed on the ground. This work will be coordinated closely with the work of Committee C-16 on Thermal Insulating Materials. Plans are being made for the presentation of a symposium on the general subject of durability tests of building constructions.

A long-range program of meetings was generally agreed upon, including a meeting and technical session in connection with the Pacific Area National Meeting in Los Angeles, during the week of September 16, 1956; 1957 ASTM Committee Week in Philadelphia; a Fall meeting in Ottawa, Canada, during the week of October 7, 1957; and the 1958 ASTM Annual Meeting in Boston.

• The Special Administrative Committee on Nuclear Problems of the American Society for Testing Materials has asked ASTM Committee E-10 on Radioactive Isotopes to extend its activities to develop basic methods for evaluating radiation-induced changes in materials.

With this in view, at its meeting February 28, Committee E-10 voted to change its title to Committee E-10 on Radioisotopes and Radiation Effects and to revise its scope, subject to final approval.

The subcommittees of Committee E-10 are being asked to prepare bibliographies of the information generally available in literature on the subjects within their scope. One of these will cover changes in materials induced by radiation. The present plan is to circulate this bibliography, appropriately subdivided, so that the other technical committees of the Society can be apprised of work which has been done in their field of activity.

The committee will sponsor a symposium of approximately 10 papers concerned with test methods using radioisotopes, as well as two papers discussing possibilities of specifications for irradiated organic materials and metals, at its next meeting in Los Angeles in September.

The Joint Atomic Industrial Forum-ASTM Symposium on Radiation Effects on Materials will also be presented at Los Angeles. This will contain about 14 papers of unclassified data on irradiated materials.

Don't Let Standards Harden

Standards drawn up at the outset of a new technical development, whether in government or private industry, can save millions of dollars in grief later on, Cyril Ainsworth told the Army Ordnance Management Engineering Training Program at Rock Island Arsenal, March 19. Mr Ainsworth is technical director of the American Standards Association.

In his plea for initiating standards at the start of a new enterprise, Mr Ainsworth declared: "In the early stages of a new industrial development, some voices are always raised against any attempt to draw up standards.

"Their advice is to 'wait until we are more familiar with the problem.' They say: 'It is too early to standardize. We don't know enough. We must not freeze or perpetuate our design'."

Such advice is sincere and well meant, but it can produce effects that are exactly opposite of those intended, Mr Ainsworth said. He added, "The standards are developed in haphazard fashion, or they are simply allowed to 'happen' on the basis of habit and custom. Where there is no systematic means for developing the new standards, there can be no means for review and revision.

"And when an attempt is made to write basic standards years later, it can be done only at a terribly increased cost and sometimes, not at all.

"Our past history and our present economy have many striking examples of the unfortunate results of such a course. They demonstrate what every standards engineer and every ordnance man knows—that standardization is a useful servant but a hard master."

He pointed out that standards are being allowed to happen in a number of industries and warned of the dangers of having standardization become solidified, rather than flexible.

Atomic energy standardization, he said, is probably the leading standards problem facing the nation today.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering copies of standards, please refer to the number following the title.

003.62 SIGNS, NOTATIONS, SYMBOLS

United Kingdom (BSI)

Graphical symbols for heating and ventilating installations BS 1553: Part 4:1956

389 METROLOGY

Japan (JISC)

5 stds for different conversion tables JIS Z 8414/8

621.3 ELECTRICAL ENGINEERING

Bulgaria

Different types of concrete cabins for accommodation of electric transformers up to 20 kv BDS 1565

Rubber-insulated copper wire BDS 1895

3 stds for porcelain insulators for transformers up to 35 kv (bound together) BDS 1905/6, 1896

Three-phase asynchronous motors for 0.6 to 20 kw for flange mounting BDS 2024

Storage batteries, sulfuric acid for BDS 1844

Radio receivers, superheterodyne type, classification, specifications BDS 1510

Canada (CSA)

Construction and test of electric flatirons C22.2 No.81-1956

China (CNS)

2 stds for ceiling electric fans CNS 597 (C 47, 49)

France (AFNOR)

Alloy metal for electric heating elements NF C 31-711

General rules pertaining to electric measuring instruments and accessories NF C 42-100

Domestic electric heating appliances: Definition, classification, testing NF C 73-117

Immersion type water heaters NF C 73-121

Television receivers connected to the main power line, safety rules for NF C 92-210

Germany (DNA)

Busbars, details of construction DIN 43673

Fuseboxes for D and NH-type fuses up to 125 amp, 500 v DIN 43637

Soldering terminal lugs DIN 46215/6

Grounding clamp for lightning conductor DIN 48819

Sheaves for electric machines DIN 42692

2 stds for protective end-bushing for insulated and armored conduits DIN 49004/5

Basic diagrams for switches and circuit breakers DIN 43678

Nominal series of loads for industrial heating elements (in watts) DIN 44920

3 types of fixed capacitors, class W2 and G2 DIN 41231/3

Hungary (MSZH)

11 stds for different hardware accessories for installation of overhead lines MNOSZ 14822/32

4 stds for different terminals connections, permanent and temporary MNOSZ 15740/4

Japan (JISC)

General rules on electric machinery and apparatus JIS C 4002 *

High voltage three-phase induction motors for general purposes JIS C 4204 *

Scale of starting current of induction motors JIS C 4204 *

Three-phase squirrel-cage motors for textile machines JIS C 4206 *

Calculating methods of three-phase induction motors characteristics JIS C 4207 *

Oil-immersed 3 kv transformers, medium size JIS C 4301 *

Oil-immersed 3 kv transformers up to 50 kva for pole installation JIS C 4302 *

Rotary variable carbon resistors, with & without switch JIS C 6404/5 *

Intermediate frequency transformers for broadcast receivers JIS C 6421 *

Miniature fixed ceramic capacitors JIS C 6423 *

Variable air capacitors for home receivers JIS C 6425 *

Incandescent lamps, 100 kv, for general use JIS C 7501 *

Different types of automobile electric bulbs JIS C 7506 *

Electrode holders for d-c or a-c arc welding JIS C 9302 *

3 types of electric fans JIS C 9601/3 *

Extended scale ammeters for electric motors JIS C 1104

Circuit testers JIS C 1202

Varnished cotton sleeves JIS C 2347

Filling compound for storage batteries and dry cells JIS C 2385/6

Three types of wire for binding of electric machines JIS C 2506/8

Pin insulators JIS C 3830

Two types of stretch insulators JIS C 3831/2

Polyvinyl-chloride insulated wire JIS C 3307

High tension shackle type insulator JIS C 3823

High tension insulating bushing JIS C 3824

Explosion-proof type plug and receptacle JIS C 4501

Small size vacuum tube base JIS C 7005

4 stds for vacuum tube bases: designation, dimensions, inspection gages JIS C 7008/11

3 stds for miniature electric lamp JIS C 7007/9

Portable electric lamp JIS C 8104

Screw lamp socket for indoor use JIS C 8302

4 stds for outlet boxes JIS C 8336/9

Bx connectors JIS C 8348/9

Portable electric drill JIS C 9605

Carbon for projectors JIS R 7301

Method of inspection silver plating JIS H 0411

2 stds for carbon and graphite electrodes JIS R 7201/2 *

The Netherlands (HCNN)

Insulated power conductors. Terminology N 1277

2 stds for metal packing glands with and without smooth packing chamber for then entry of electric cables N 2113/4

Plastic packing glands for watertight entry of electric cables N 2115

Hexagon nuts with B. S. P. thread for packing glands N 2116

Glossary of terms used in Electrical Engineering. General N 5036

Telegraphy, Telephony, Signalling—general rules for internal cables V 1613

Domestic electric vacuum cleaner and polishers. Terminology V 3037

Poland

Electric wiring cable terminology PN E-01002

Graphic symbols for switches PN E-01211

3-phase asynchronous motors, standard rated power of 0.6 to 100 kw PN E-02110

Testing of insulation of electric wires PN E-041161

Testing of magnetic dynamo sheets PN E-04452

Copper wire, paper-, cotton- and rubber insulated PN E-90012/3

Lead sheathed rubber insulated cable PN E-90020

Clamps for overhead lines PN E-92322

Swan-neck and straight insulator pins PN E-92405/6

Spain (IRATRA)

Electric traction motors, d-c UNE 21010

Copper wire for electric lines UNE 21011

Connecting boxes for railroad car lighting circuits UNE 25048

Sweden (SIS)

Dimensioning of electric plants with regard to short-circuiting SEN 2101

Insulating oil. Packaging and testing SEN 040302

Spring contact fuses up to 500 v SEN 280501

Screw contact fuses up to 500 v SEN 280502

8 stds for medical x-ray equipment. Component parts. Testing SEN 860201/8

Union of South Africa (SABS)

Electric cooking plates SABS 154-1955

United Kingdom (BSI)

Polyvinyl chloride insulated cables and flexible cords for electric power and lighting BS 2004:1955

Performance of power transformers (not exceeding 2kva rating) for radio and allied electronic equipment BS 2214:1955

Colour codes for connections in radio and allied electronic equipment (excluding telephone exchange and associated transmission equipment) BS 2311:1955

Varnished cambric insulated cables for electricity supply BS 608:1956

Flexible trailing cables for quarries and metalliferrous mines BS 1116:1956

Zinc anodes, zinc cyanide and zinc oxide for electroplating BS 2656:1956

Fluoroboric acid and metallic fluorobates for electroplating BS 2657:1956

Guide to terms used in a-c power system studies BS 2658:1956

Recommended methods for estimating the effect of deleterious substances in fibrous electrical insulating materials BS 2689: 1956

Fuses for alternating-current circuits above 660 volts BS 2692:1956

Mains-operated electric fence controllers BS 2632:1955

Cord-operated ceiling switches BS 2652:1955

Dimensions of impulse magnetos (unscreened and screened) BS 2688:1955

621.9 MACHINE TOOLS. TOOLS

Germany (DNA)

Hard metal cutting tips of drills DIN 8010

T-slots DIN 650

India (ISI)

Specification for adzes IS 663-1955

Poland

6 stds for files PN M-64740/3, 64745/6

Spindle ends for lathes PN M-55071

2 stds for checking machines for working plastics PN M-55691/2

Sweden (SIS)

4 stds for hard metal roughing tools SMS 1771/4

629.113 MOTOR VEHICLES, GENERAL

Hungary (MSZH)

Automobile batteries MNOSZ 18433

4 stds for different type tire valves MNOSZ 18717/20

Poland

Mechanical testing of piston rings PN S-36502

Trailers' coupling PN S-47296

629.12 SHIPS AND SHIPBUILDING

France (AFNOR)

8 stds for cast iron marine ventilators and their details NF J 45-100, -110, -112, -114, -120, -122, -126, -128

The Netherlands (HCNN)

Marking of wooden hatches N 1333

Marking of shifting beams N 1334

Ships' pipelines. Minimum wall thickness N 1558

Rules for drawing electrical diagrams for ships' circuits V 3058

629.13 AIRCRAFT ENGINEERING

Belgium (IBN)

Aluminum alloy for aircraft rivets NBN 381.21

Toilet flushing and draining connections on aircraft NBN 384.111

Fuel nozzle grounding plug and socket in aircraft NBN 385.111

Pressure cabin ground test connection in aircraft NBN 386.621

Jacking pads for aircraft NBN 388.111

United Kingdom (BSI)

Steel bolts (unified hexagons and unified threads) for aircraft BS 2 A.102, Jan. 1956

Steel nuts (unified hexagons and unified threads) (ordinary, thin, slotted and castle) for aircraft BS 2 A.103, Jan. 1956

Corrosion-resisting steel bolts (unified hexagons and unified threads) for aircraft BS 2 A.104, Jan. 1956

Corrosion-resisting steel nuts (unified hexagons and unified threads) (ordinary, thin, slotted and castle) for aircraft BS 2 A.105, Jan. 1956

Aluminum alloy nuts (unified hexagons and unified threads) (ordinary and slotted) for aircraft BS 2 A.107, Jan. 1956

Steel bolts (unified hexagons, unified threads and close tolerance shanks) for aircraft BS 2 A.108, Jan. 1956

Cadmium plated steel bolts (unified hexagons, unified threads and close tolerance shanks) for aircraft BS 2 A.111, Jan. 1956

Aluminum alloy bolts (unified hexagons, and unified threads) for aircraft BS 2 A.169, Jan. 1956

669 METALLURGY

France (AFNOR)

Gravimetric method for determination of sulphur content in iron ores NF A 06-114

Colorimetric method for determination of zinc content in lead NF A 06-510

India (ISI)

Wrought aluminum and aluminum alloys —sheet and strip IS 1470:1955

Wrought aluminum and aluminum alloys —bars, rods and sections IS 1476:1955

Steel for pre-stressed concrete—Part 1: Plain hard drawn steel wire IS 2691:Part 1:1955

Mexico (DGN)

Cold rolled brass plates, sheets, strips DGN B 75-1955

Forging brass DGN B 77-1955

Spain (IRATRA)

Testing copper-zinc alloys for embossing UNE 7080

Moulding aluminum alloy, Al-Si group UNE 38254

Moulding aluminum alloy, Al-Sn group UNE 38291

Netherlands (HCNN)

Chemical analysis of metals. Part I—Ferrous metals V 1033-1A

Poland

Tin alloys and lead-tin alloys for bearings PN H-87111

5 stds for chemical analysis of nickel alloys PN H-04817/8, -04822, -04828, -04830

5 stds for chemical analysis of cobalt PN H-04212/3, -04215, -04219/20

Chemical analysis of pickled pig-iron PN H-18023

Chemical analysis of ferro-manganese alloys PN H-18022

Mineral wool derived from blast furnace slag PN B-23100, -23111, -23005

Blast furnace slag for road building PN B-06731

Chemical analysis of tin bronze PN H-04745

Classification of stainless steel PN H-86020

Chemical analysis of cast aluminum PN H-04760

Sweden (SIS)

Case hardening and nitrated steels: Survey MNC 851

Tempering steel: survey MNC 852

Tension test of brass SIS 117101

Copper seamless tubes SIS 126300

Temperable steel, grade 2234 SIS 142234

Temperable steel, grade 2244 SIS 142541

Case hardening steel, two grades, 25 11/12 SIS 1425 11/12

United Kingdom (BSI)

Steel plate, sheet and strip BS 1449:1956

Wrought aluminum and aluminum alloys: Rivet, bolt and screw stock for forging BS 1473:1955

Wrought aluminum and aluminum alloys: Extruded round tube and hollow sections BS 1474:1955

Wrought aluminum and aluminum alloys: Wire BS 1475:1955

Wrought aluminum and aluminum alloys: Plate BS 1477:1955

Helical and volute springs and spring steels (railway rolling stock material) BS 24:Part 3B:1955

Aluminum and aluminum alloy ingots and castings for general engineering purposes BS 1490:1955

696.2 GAS INSTALLATION

The Netherlands (HCNN)

Regulations for gas installation N 1078

Flue pipes and reducers N 1777

Wall plate N 1778

Flue pipe bends V 1145

Dry gas meters for industrial use V 1123

BOOKS

International System for the Transliteration of Cyrillic Characters. ISO Recommendation R9. *First Edition. October 1955. International Organization for Standardization, Geneva, Switzerland. (Copies available from the American Standards Association, 70 E. 45 Street, New York 17, N. Y. $1.00)*

This international system for the transliteration of Cyrillic characters was approved by 20 of the Member-Bodies of the International Organization for Standardization, the national standards associations of 34 countries.

The Recommendation offers a table of Cyrillic characters with their corresponding Latin characters. It applies to Bulgarian, Russian, Ukrainian, White Russian, and Serbian.

As explained in the General Principles, presented as an Introductory Note, "The sole purpose of transliteration, used chiefly for bibliographical and library work, is to enable texts in non-Latin alphabets to be reproduced by typewriters or other devices possessing only Latin characters, possibly with just the barely essential supplementary signs (diacriticals, etc) added."

The fact that characters or signs, not sounds, are represented, is what distinguishes transliteration from transcription, it is explained.

Purpose of the Recommendation is to make it possible for anyone able to identify the language of the original to transliterate automatically.

Whenever items are transliterated according to this international system they are to be identified by the letters "ISO" in square brackets [ISO].

Macedonian, which has recently been constituted as a literary language, is written in Cyrillic script. It can be transliterated in the same way as Serbian with the addition of two characters.

ISO Member-Bodies of the following countries approved the Recommendation: Austria; Chile; Denmark; France; Germany; Hungary; Ireland; Israel; Italy; Mexico; Netherlands; New Zealand; Pakistan; Poland; Portugal; United Kingdom; Spain; Sweden; Switzerland; Yugoslavia.

Although this is an "international recommendation," the ISO points out that for each individual country the only valid standard is the national standard of that country. The American Standards Association is the Member-Body of the United States in the International Organization for Standardization.

Pipe Threads for Gas List Tubes and Screwed Fittings Where Pressure-Tight Joints Are Made on the Threads (1/8 inch to 6 inches). ISO R7. *First edition. May 1955. International Organization for Standardization, Geneva, Switzerland. (Available from the American Standards Association, 70 East 45 Street, New York 17, N. Y. $1.50).*

This international recommendation consists of two tables of dimensions relating to screwed tubes and to threads in cocks, valves, and any fittings to be connected to screwed tubes.

The dimensions shown in Table 1 were taken from British Standard B.S. 21:1938 on Pipe Threads, Part I: Basic Sizes and Tolerances. In Table 2, these dimensions have been converted into millimeters on the basis of 1 inch equals 25.4 mm.

The values in Table 2 for the pitch, the depth of thread, and the major diameter at gage plane are computed in ten-thousandths of a millimeter and rounded to the next thousandth of a millimeter.

The Recommendation was approved by 25 Member-Bodies: Australia, Austria, Belgium, Chile, Denmark, Finland, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Pakistan, Portugal, Spain, Sweden, Switzerland, United Kingdom, Yugoslavia. It was developed by Techical Committee 5 on Pipes and Fittings, with the Association Suisse de Normalisation as secretariat. The USA has observer status on this committee.

Specification for Electrical Control Equipment Installed on Motor Vehicles. (Rail Cars and Locomotives), IEC Publication 77. *First edition. 1955. International Electrotechnical Commission, Geneva, Switzerland. (Available from the American Standards Association, 70 E. 45 Street, New York 17, N. Y. $2.00.)*

Developed by the IEC and the International Mixed Committee on Electric Traction (CMT), of which the International Union of Railways is a member, this specification applies in principle to all parts of rail cars and locomotives designed for line voltage or for low voltage operation. It does not, however, apply to rotating machines and static rectifiers.

Section A applies to rail cars and locomotives supplied with direct current; Section B applies to those that are supplied with single-phase alternating current.

Provisions include classification and characteristics of apparatus; nominal supply voltages; equivalent continuous rating and equivalent continuous rated current and rated voltage; rated rupturing capacity; check tests; measurement of electrical resistance; temperature-rise tests; dielectric tests; among others.

The specification has been explicitly approved by the IEC National Committees of Belgium, Denmark, France, German Federal Republic, Japan, Netherlands, Sweden, Union of South Africa, United Kingdom, United States of America, and Yugoslavia, and by the International Union of Railways.

AMERICAN STANDARDS UNDER WAY

Status as of May 31, 1956

BUILDING AND CONSTRUCTION

American Standard Published

Minimum Design Loads in Buildings and Other Structures, Building Code Requirements for, A58.1-1955 $1.50
Sponsor: National Bureau of Standards
Building code requirements, governing assumptions for dead, live, and other loads in the design of buildings and other structures which are subject to such requirements.

American Standards Approved

Drain Tile, Specifications for, ASTM C 4-55; ASA A6.1-1956 (Revision of ASTM C 4-50T; ASA A6.1-1954)
Sponsor: American Society for Testing Materials

Structural Clay Load-Bearing Wall Tile, Specifications for, ASTM C 34-55; ASA A74.1-1956 (Revision of ASTM C 34-52; ASA A74.1-1953)

Concrete Building Brick, Specifications for, ASTM C 55-55; ASA A75.1-1956 (Revision of ASTM C 55-52; ASA A75.1-1953)

Concrete Masonry Units, Methods of Sampling and Testing, ASTM C 140-55; ASA A84.1-1956 (Revision of ASTM C 140-52; ASA A84.1-1953)

Vitrified Clay Filter Block for Trickling Filters, ASTM C 159-55; ASA A102.1-1956 (Revision of ASTM C 159-51; ASA A102.1-1954)

Definitions of Terms Relating to Structural Clay Tile, ASTM C 43-55; ASA A104.1-1956 (Revision of ASTM C 43-50; ASA A104.1-1954)
Sponsor: American Society for Testing Materials

Inorganic Aggregate for Use in Interior Plaster, ASTM C 35-54T; ASA A107.1-1956 (Revision of ASTM C 35-53T; ASA A107.1-1954)
Sponsor: American Society for Testing Materials

In Standards Board

Billet-Steel Bars for Concrete Reinforcement, ASTM A 15-54T; ASA A50.1 (Revision of ASTM A 15-39; ASA A50.1-1939)

Rail-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 16-54T; ASA A50.2 (Revision of ASTM A 16-35; ASA A50.2-1936)

Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units (Revision of ASTM C 126-52T; ASA A101.1-1954)
Sponsor: American Society for Testing Materials

In Standards Board

Steel for Bridges and Building, Specifications for, ASTM A 7-55T; ASA G24.1

Structural Silicon Steel, Specifications for, ASTM A 94-54; ASA G41.1

Structural Rivet Steel, Specifications for, ASTM A 141-55; ASA G21.1

High-Strength Steel Castings for Structural Purposes, Specifications for, ASTM A 148-55; ASA G52.1

Axle-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 160-54T; ASA G43.1

High-Strength Structural Rivet Steel, Specifications for, ASTM A 195-52T; ASA G42.1

CONSUMER GOODS

American Standard Approved

Test Procedures for Household Electric Refrigerators (Mechanically Operated), B38.2-1956 (Revision of B38.2-1944)
Sponsors: American Society of Refrigerating Engineers; Clothing and Housing Research Branch, Agricultural Research Service, U.S. Department of Agriculture

Standard Submitted

Milled Toilet Soap, Tentative Specifications for, Revision of ASTM D 455-53 T; ASA K60.4-1954
Sponsor: American Society for Testing Materials

ELECTRIC AND ELECTRONIC

American Standards Published

Aluminum Bars for Electrical Purposes (Bus Bars), Specifications for, ASTM B236-55T; ASA C7.27-1956 $.30

Zinc-Coated (Galvanized) High-Tensile Steel Telephone and Telegraph Line Wire, ASTM A 326-52; ASA C7.30-1956 $.30

Zinc-Coated Steel Wire Strand, "Galvanized" and Class A ("Extra Galvanized"), Tentative Specifications for, ASTM A 122-54 T; ASA C7.32-1956 $.30

Zinc-Coated Steel Wire Strand (Class B and Class C Coatings), Specifications for, ASTM A218-54T; ASA C7.33-1956 $.30
Sponsor: American Society for Testing Materials

American Standards Approved

Terminal Markings for Electrical Apparatus, C6.1-1956 (Revision of C6.1-1944)
Sponsor: National Electrical Manufacturers Association

Safety for Transformer-Type Arc-Welding Machines, C33.2-1956

Safety for Cord Sets and Power-Supply Cords, C33.3-1956

Safety for Specialty Transformers, C33.4-1956

Safety for Wire Connectors and Soldering Lugs, C33.5-1956
Sponsor: Underwriters' Laboratories

In Standards Board

Zinc-Coated (Galvanized) Steel Core Wire (With Coatings Heavier than Standard Weight) for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 261-55; ASA C7.34

Three-Quarter Hard Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 262-55; ASA C7.35

Standard Nominal Diameters and Cross-Sectional Areas of AWG Sizes of Solid Round Wires Used as Electrical Conductors, Specifications for, ASTM B 258-51 T; ASA C7.36

Bronze Trolley Wire, Specifications for, ASTM B 9-55; C7.5 (Revision of C7.5-1953)

Copper Trolley Wire, Specifications for, ASTM B 47-55; ASA C7.6 (Revision of C7.6-1953)

Soft Rectangular and Square Bare Copper Wire for Electrical Conductors, Specifications for; ASTM B 48-55; ASA C7.9 (Revision of C7.9-1953)

Hard-Drawn Copper Alloy Wires for Electrical Conductors, Specifications for, ASTM B 105-55; ASA C7.10 (Revision of C7.10-1953)

Figure-9 Deep-Section Grooved and Figure-8 Copper Trolley Wire for Industrial Haulage, Specifications for, ASTM B 116-55; ASA C7.11 (Revision of C7.11-1953)

Hard-Drawn Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 230-55 T; ASA C7.20 (Revision of C7.20-1953)

Concentric-Lay-Stranded Aluminum Conductors, Hard-Drawn and Three Quarter Hard-Drawn, Specifications for, ASTM B 231-55; ASA C7.21 (Revision of C7.21-1953)

Concentric-Lay-Stranded Aluminum Conductors, Steel - Reinforced, Specifications for, ASTM B 232-55 T; ASA C7.22 (Revision of C7.22-1953)

Rolled Aluminum Rods (EC Grade) for Electrical Purposes, Specifications for, ASTM B 233-55; ASA C7.23 (Revision of C7.23-1953)

Standard Weight Zinc-Coated (Galvanized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 245-55; ASA C7.28 (Revision of C7.28-1953)
Sponsor: American Society for Testing Materials

Cotton Braid for Insulated Wire and Cable for General Purposes, Revision of C8.12-1942
Sponsor: Electrical Standards Board

Distribution, Power, and Regulating Transformers, and Reactors other than Current-Limiting Reactors, Revision of C57.12-1949

Requirements for Transformers, 67,000 Volts and Below; 501 through 10,000 Kva, 3-Phase; 501 through 5,000 Kva, 1 Phase, Revision of C57.12a-1954
Test Code for Distribution, Power, and Regulating Transformers, Revision of C57.22-1948
Sponsor: Electrical Standards Board
Vulcanized Fiber Sheets, Rods and Tubes Used for Electrical Insulation, Specifications for, ASTM D 710-54T; C59.29
Laminated Thermosetting Materials, Specifications for, (Revision of NEMA LP1-1951; C59.16-1952) ASTM D 709.55T; NEMA LP1-1955; ASA C59.16
Sponsor: American Society for Testing Materials
Definitions of Semiconductor Terms, ASA C60.14; IRE 7.S2
Sponsor: Joint Electron Tube Engineering Council
A-25 Bulb, Medium Screw Base, Incandescent Lamps, C78.252
A-23 Bulb, Medium Screw Base, Incandescent Lamps (Over-all Length-maximum 6-5/16 in., minimum 5⅞ in.), C78.253
General Service Incandescent Lamps for 115-, 120-, and 125-volt Circuits, C78.100 (Revision of C78.100-1953)
Miniature Incandescent Lamps, C78.140 (Revision of C78.140-1954)
Sponsor: Electrical Standards Board

Reaffirmation Being Considered

Rope-Lay-Stranded Copper Conductors Having Bunch-Stranded Members for Electrical Conductors, Specifications for, ASTM B 172-55; ASA C7.12-1953
Rope-Lay-Stranded Copper Conductors Having Concentric-Stranded Members for Electrical Conductors, Specifications for, ASTM B 173-55; ASA C7.13-1953
Bunch-Stranded Copper Conductors for Electrical Conductors, Specifications for, ASTM B 174-55; ASA C7.14-1953
Sponsor: American Society for Testing Materials
The ASTM status of these standards has changed from tentative to standard with a consequent change in the year designation, but with no change in substance.

GAS-BURNING APPLIANCES

American Standards Published

Approval Requirements for Domestic Gas Ranges, Z21.1-1955 $2.00
Approval Requirements for Gas-Fired Duct Furnaces, Z21,34-1955 $1.50
Sponsor: American Gas Association

MATERIALS AND TESTING

American Standard Published

Recommended Practice for Safeguarding Against Embrittlement of Hot Galvanized Structural Steel Products and Procedures for Detecting Embrittlement, ASTM A 143-46; ASA G8.13-1956 $.30
Sponsor: American Society for Testing Materials

American Standard Approved

Methods of Sample Preparation for Physical Testing of Rubber Products, ASTM D 15-55T; ASA J1.1-1956 (Revision of ASTM D 15-54T; ASA J1.1-1955)
Sponsor: American Society for Testing Materials
Copper and Copper-Base Alloy Forging Rod, Bar, and Shapes, ASTM B 124-55; ASA H7.1-1956 (Revision of ASTM B 124-54; ASA H7.1-1954)
Rolled Copper-Alloy Bearing and Expansion Plates and Sheets for Bridge and Other Structural Uses, ASTM B 100-55; ASA H31.1-1956 (Revision of ASTM B 100-54; ASA H31.1-1954
Sponsor: American Society for Testing Materials
Specifications for Thermometers, ASTM E 1-55; ASA Z71.1-1956 (Revision of ASTM E 1-53; ASA Z71.1-1954)
Sponsor: American Society for Testing Materials

Reaffirmation Approved

Zinc-Coated (Galvanized) Iron or Steel Tie Wires, Specifications for, ASTM A 112-33; ASA G8.4-1935 R1956
Zinc-Coated Iron or Steel Chain-Link Fence Fabric Galvanized After Weaving, Specifications for, ASTM A 117-33; ASA G8.5-1935 R1956
Zinc-Coated (Galvanized) Iron or Steel Farm-Field and Railroad Right-of-Way Wire Fencing, Specifications for, ASTM A 116-48; ASA G8.9-1948 R 1956
Sponsor: American Society for Testing Materials

Standard Submitted

Alloy Designation System for Wrought Aluminum
Submitted by: The Aluminum Association

MECHANICAL

American Standards Published

20-Degree Involute Fine Pitch System for Spur and Helical Gears, AGMA 273.04; ASA B6.7-1956 $1.50
Inspection of Fine-Pitch Gears, AGMA 236.04; ASA B6.11-1956 $2.50
Sponsors: American Gear Manufacturers Association; American Society of Mechanical Engineers
Slotted and Recessed Head Wood Screws, B18.6.1-1956 $1.00
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers.

American Standard Approved

Hexagon Head Cap Screws, Slotted Head Cap Screws, Square Head Set Screws, Slotted Headless Set Screws, B18.6.2-1956
Sponsors: Society of Automotive Engineers; The American Society of Mechanical Engineers

In Standards Board

Design for Fine-Pitch Worm Gearing, Revision of B6.9-1950
Sponsors: American Gear Manufacturers Association; The American Society of Mechanical Engineers
Conveyor Terms and Definitions, B75
Sponsor: Conveyor Equipment Manufacturers Association
Boiler Rivet Steel and Rivets, Specifications for, ASTM A 31-55; ASA G28.1
Carbon-Silicon Steel Plates of Intermediate Tensile Ranges for Fusion-Welded Boilers and Other Pressure Vessels, Specifications for, ASTM A 201-54T; ASA G31.1
Chromium - Manganese - Silicon (CMS) Alloy-Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 202-54T; ASA G32.1
Nickel-Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 203-54T; ASA G33.1
Molybdenum-Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 204-54T; ASA G34.1
High Tensile Strength Carbon-Silicon Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 212-52aT; ASA G35.1
Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service, Specifications for, ASTM A 182-55T; ASA G37.1
Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service, Specifications for, ASTM A 194-55T; ASA G38.1
Forged or Rolled Steel Pipe Flanges, Forged Fittings, and Valves and Parts for General Service, Specifications for, ASTM A 181-55T; ASA G46.1

Standard Submitted

Life Tests for Single-Point Tools of Sintered Carbide, B5
Sponsors: American Society of Tool Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers; The American Society of Mechanical Engineers

New Project Requested

Dimensional Standardization of Lap Joint Pressure Vessel Flanges
Requested by: Chemical Industry Advisory Board

MEDICAL

Project Initiated

Standards for Anesthetic Equipment
Requested by: American Society of Anesthesiologists

OPTICS

Project Initiated

Standards for Ophthalmic Lenses, Z80
Requested by: Indiana Interprofessional Committee on Eye Care

PAINTS AND VARNISHES

American Standards Approved

Raw Linseed Oil, Specifications for, ASTM D 234-55; ASA K34.1-1956 (Revision of ASTM D 234-48; ASA K34-1949)
Boiled Linseed Oil, Specifications for, ASTM D 260-55; ASA K35.1-1956 (Revision of ASTM D 260-48; ASA K35-1949)
Tinting Strength of White Pigments, Method of Test for, ASTM D 322-55; ASA K56.1-1956 (Revision of ASTM D 322-36; ASA K56-1941)
Sponsor: American Society for Testing Materials

PETROLEUM PRODUCTS AND LUBRICANTS

American Standard Published

Knock Characteristics of Motor Fuels by the Research Method, ASTM D 908-55; ASA Z11.69-1955 $.30
Sponsor: American Society for Testing Materials

PHOTOGRAPHY

American Standards Published

Photographic Graduates, PH4.9-1956 $.25
Defines the requirements for graduates suitable for use with common photographic processing solutions, not including precision laboratory graduates.
Internal Dimensions for Deep Tanks for Manual Processing of Amateur Roll Film, PH4.19-1956 $.25
Defines deep tanks for manual processing of amateur roll film on hangers. Only the dimensions that are critical with respect to solution volume and film plus clip-length acceptance are given.
X-ray Sheet Film Hangers (Clip-Type), PH4.18-1956 $.25
Defines clip or pin-type frame hangers for use in the processing of single x-ray sheet films and gives the dimensions of such hangers.

Channel-Type Multiple Photographic Hangers (Plates and Sheet Film), PH4.22-1956 $.25

Defines channel-type frame hangers for use in the simultaneous processing of multiple sheet films or plates, and gives dimensions of such hangers.
Sponsor: Photographic Standards Board

In Standards Board

Method for Determining the Actinity or the Relative Photographic Effectiveness of Illuminants, Revision of PH2.3-1953

Definition of a Fine Grain Developer, PH4.14
Sponsor: Photographic Standards Board

PIPE AND FITTINGS

In Board of Review

Welded and Seamless Steel Pipe, Specifications for, ASTM A 53-55 T; ASA B36.1

Welded Wrought-Iron Pipe, Specifications for, ASTM A 72-55; ASA B36.2

Seamless Carbon-Steel Pipe for High-Temperature Service, Specifications for, ASTM A 106-55 T; ASA B36.3

Electric-Fusion (Arc)-Welded Steel Plate Pipe (Sizes 16 in. and over), Specifications for, ASTM A 134-54; ASA B36.4

Electric-Resistance-Welded Steel Pipe, Specifications for, ASTM A 135-55T; ASA B36.5

Electric-Fusion (Arc)-Welded Steel Pipe Sizes 4 in. and over), Specifications for, ASTM A 139-55; ASA B36.9

Electric-Fusion-Welded Steel Pipe for High Temperature Service, Specifications for, ASTM A 155-55T; ASA B36.11

Seamless Steel Boiler Tubes, Specifications for, ASTM A 83-55T; ASA B36.12

Electric-Resistance-Welded Steel and Open-Hearth Iron Boiler Tubes, Specifications for, ASTM A 178-55T; ASA B36.13

Seamless Steel Boiler Tubes for High-Pressure Service, Specifications for, ASTM A 192-55T; ASA B36.14

Medium-Carbon Seamless Steel Boiler and Superheater Tubes, Specifications for, ASTM A 210-55T; ASA B36.15

Spiral-Welded Steel or Iron Pipe, Specifications for, ASTM A 211-54; ASA B36.16

Seamless Alloy-Steel Boiler, Superheater, and Heat Exchanger Tubes, Specifications for, ASTM A 213-55T; ASA B36.17

Electric-Resistance-Welded Steel Boiler and Superheater Tubes for High-Pressure Service, Specifications for, ASTM A 226-55T; ASA B36.18

Welded and Seamless Open-Hearth Iron Pipe, Specifications for, ASTM A 253-55 T; ASA B36.23

Seamless and Welded Austenitic Stainless Steel Pipe, Specifications for, ASTM A 312-55 T; ASA B36.26

In Board of Review

Seamless Low-Carbon and Carbon-Molybdenum Steel Still Tubes for Refinery Service, Specifications for, ASTM A 161-55 T

Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 179-55 T

Seamless Cold-Drawn Intermediate Alloy-Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 199-55 T

Seamless Intermediate Alloy-Steel Still Tubes for Refinery Service, Specifications for, ASTM A 200-55 T

Seamless Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes, Specifications for, ASTM A 209-55 T

Electric-Resistance-Welded Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 214-55 T

Welded Austenitic Stainless Steel Boiler, Superheater, Heat Exchanger and Condenser Tubes, Specifications for, ASTM A 249-55 T

Electric-Resistance-Welded Carbon-Molybdenum Alloy-Steel Boiler and Super-heater Tubes, Specifications for, ASTM A 250-55 T

Copper-Brazed Steel Tubing, Specifications for, ASTM A 254-55 T

Seamless and Welded Ferritic Stainless Steel Tubing for General Service, Specifications for, ASTM A 268-55

Seamless and Welded Austenitic Stainless Steel Tubing for General Service, Specifications for, ASTM A 269-55

Seamless and Welded Austenitic Stainless Steel Tubing, Specifications for, ASTM A 270-55

Seamless Austenitic Chromium-Nickel Steel Still Tubes for Refinery Service, Specifications for, ASTM A 271-55

Seamless and Welded Steel Pipe for Low-Temperature Service, Specifications for, ASTM A 333-55 T

Seamless and Welded Steel Tubes for Low-Temperature Service, Specifications for, ASTM A 334-55 T

Seamless Ferritic Alloy-Steel Pipe for High-Temperature Service, Specifications for, ASTM A 335-55 T

Seamless Copper Water Tube, Specifications for, ASTM B 88-55; ASA H23.1-1956 (Revisions of ASTM B 88-54; ASA H23.1-1954)

Seamless Copper Pipe, Standard Sizes, Specifications for, ASTM B 42-55; ASA H26.1-1956 [Revision of ASTM B 42-54; ASA H26.1-1954 (2nd ed)]

Seamless Red Brass Pipe, Standard Sizes, Specifications for, ASTM B 43-55; ASA H27.1-1956 [Revision of ASTM B 43-54; ASA H-27.1-1954 (2nd ed)]
Sponsor: American Society for Testing Materials

Standard Submitted

Bituminous Fibre Drain and Sewer Pipe, Commercial Standard CS 116-54
Submitted by: Office of Technical Services, U. S. Department of Commerce

(Continued from page 171)

ence of field service, or from experimental results.

Other things considered, the smoother the surface, with adequate lubrication, the more efficient will be the performance, and the longer the life of the part. The maintenance problem also will be less critical.

Perhaps the first important factor the surface roughness committee has to consider in choosing a roughness number is the roughness-width cutoff value of the instrument. On this point the American Standard says, in Paragraph 9, Appendix B:

"In general, surfaces will contain irregularities with a large range of widths. Instruments are designed to respond only to irregularity spacings less than a given value, called the roughness-width cutoff. In some cases, such as surfaces in which actual contact area with a mating surface is important, the largest convenient roughness-width cutoff will be used. In other cases, such as surfaces subject to fatigue failure, only the irregularities of small width will be important, and more significant values will be obtained when a short roughness-width cutoff is used. In still other cases, such as identifying chatter marks on machined surfaces, information is needed on only the widely spaced irregularities. For such measurements, a long roughness-width cutoff instrument should be used with a large radius stylus which will not respond to the more closely spaced irregularities."

Determining Standards for Individual Parts

Each part must be studied for its functional requirements. The surface roughness of a representative number of parts should be measured to determine what appears to be the average roughness and the range of roughness. It is desirable to measure these sample units with instruments adjusted to different frequency-cutoff values. This will indicate whether the roughness is composed of regularly spaced irregularities or whether it is composed of irregularities of different wave

lengths. This initial study will answer the question of average roughness, and the question of frequency cutoff.

This information must be supplemented by any historical information on the functional performance of the part. If fatigue failure has been a factor in the life of the part, more attention must be given to closely spaced irregularities, or irregularities of short wave length. This indicates specifying a shorter cutoff value. Hence, it is important that before a surface roughness value is determined, the design engineer consult with the manufacturing organization, the inspectors, and the service department. No general rules can be promulgated which will replace this surface roughness committee. Each part must be studied by itself, and all available data and information must be given adequate consideration. Once proper surface-roughness values have been agreed upon, the information is placed in the engineering design standards book and made available to the drafting personnel for their guidance. Figure 4 (see page 171) shows a "standard" sheet used for this purpose. It will be noted that the surface to be controlled is definitely described and identified. All other surfaces on the part are finished in the regular way and the finish obtained is accepted.

This standard sheet does not indicate the frequency-cutoff values to be used because at the time the data were compiled, this information was not available.

The information in these standards sheets is used by the draftsmen in designating the proper surface-roughness value on drawings. It is necessary that draftsmen be instructed to use this information in making up drawings, for, unless this is done, the shop may still use its own judgment in finishing the part.

Experience has shown that the use of surface-roughness standards reduces manufacturing costs by standardizing finishing operations. It also results in more uniform quality and improves interchangeability of parts.

Standards Outlook

by Leo B. Moore

Management Action

There is nothing like personal involvement to provide understanding and appreciation of a human activity like standardization. With this involvement should go opportunity for folks to give testimony of their interests and beliefs. In standards work, as we think about top management sponsorship, we should be alert for opportunities for members of management to become involved personally and to contribute their managerial viewpoint and talents to the standards effort.

A man does not generally marry a woman whom he has not met, and a man does not usually espouse a cause with which he is not familiar. It has amazed me to talk to executives who have not known of their company membership in ASA and what that membership could mean to their operations. My reaction is that this is not the fault of the executive so much as it is the fault of someone in the organization who has missed a fine opportunity to talk standards with a management man.

A positive approach to gaining standards interest lies in creating opportunities for active participation of management in the program. One suggestion is to combine action — having the man do something — and publicity — having the man talk or write about what he did. As examples, we might take the three areas, Objectives, Policy, and Evaluation. With respect to objectives, ask management to join with you in writing about the aims of the standards effort in terms of your company, and have management publish these objectives as a document that has its blessing and support. With regard to policy, ask management to sit on a steering committee that reviews the work of the standards group and establishes policy of operation for that group. Make certain that records of these decisions are published in a document that is printed and given to interested parties in the company. In connection with evaluation, help management to take an objective view of the actual results as compared with the established objectives as a form of assessment of the activity. Be alert for every opportunity for management to talk and write about these accomplishments.

A fine example is found in The Detroit Edison Company. Through the good offices of Leon J. Jacobi of that company I have long been acquainted with the program. Lately I have seen the annual report of the Standards Committee. Here is a picture of the program presented as if it were written for the stockholders. It provides facts and data, and even more importantly, pictures and names of the men who have contributed to these efforts. The report gives a sense of the deep feeling that they and their company have for standards, and its value to their enterprise.

•

Mr Moore is Assistant Professor of Industrial Management at Massachusetts Institute of Technology where he teaches a full-term course in industrial standardization.

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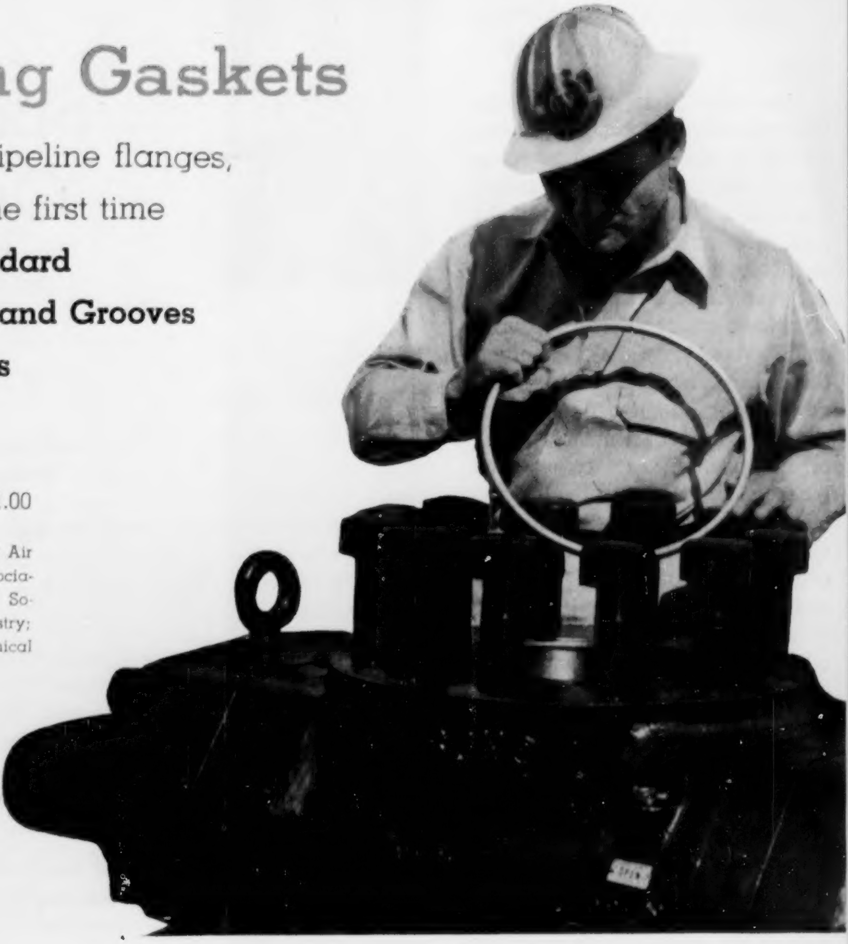

For complete list of 28 other American Standards for Pipe, Pressure Piping Code, and Pipe Flanges and Fittings, see Price List of American Standards (available without charge from ASA.)

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  Iron and steel gate, plug, and check valves for pipe-line service (API 600);
  Wellhead equipment (API 6E0);
  Special purpose flanges.
- Specifications for materials
- Table of dimensions from 1 11/32 pitch diameter to 40¼ pitch diameter; also width of ring, height of ring, and width on flat of octagonal ring.
- Tolerances
- Finish
- Identification number
- How to mark flanges and gaskets